

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

aQK495
.G74U53

Important Native Grasses for RANGE CONSERVATION in **FLORIDA**



U. S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, GAINESVILLE, FLORIDA

AD-68 (Revised)
(2-61)

NATIONAL

**A
G
R
I
C
U
L
T
U
R
A
L**



LIBRARY

21174

CONTENTS

	Page
INTRODUCTION	1
PARTS OF A GRASS PLANT	3
GRASS DESCRIPTIONS	
Barnyardgrass	11
Bluestem	
broomsedge bluestem	13
bushybeard bluestem	17
cabanis bluestem	19
chalky bluestem	21
creeping bluestem	25
Florida bluestem	130
hairy bluestem	29
purple bluestem	31
South Florida bluestem	35
splitbeard bluestem	39
Tracy bluestem	130
Blue maidencane	41
Bristlegrass	
knotroot bristlegrass	45
Carpetgrass	47
big carpetgrass	47
common carpetgrass	47
Chloris	
saltmarsh chloris	49
stiffleaf chloris	51
Cordgrass	
big cordgrass	53
marshhay cordgrass	55
sand cordgrass	57
smooth cordgrass	61
Cutthroat grass	63
Dropseed	
Curtiss dropseed	65
Florida dropseed	131
pinewoods dropseed	67
Gamagrass	
eastern gamagrass	129
Jointtail	
Florida jointtail	129

U. S. DEPT. OF AGRICULTURE
NATIONAL

JUL 19 1974

RECEIVED

	Page
Indiangrass	
Indiangrass	69
lopsided indiangrass	69
Lovegrasses	73
coastal lovegrass	73
Elliott lovegrass	73
purple lovegrass	73
Thalia lovegrass	73
Maidencane	75
Muhlenbergia	
cutover muhly	79
Gulf muhly	131
hairawn muhly	131
Needlegrass	
blackseed needlegrass	81
Panicum	
beaked panicum	83
Combs panicum	83
hairy panicum	85
longleaf panicum	83
purple panicum	83
redtop panicum	83
P. condensum (no common name)	83
bluejoint panicum	89
low panicum	93
Paspalum	
brownseed paspalum	95
gulfdune paspalum	97
Florida paspalum	99
low paspalums	101
barestem paspalum	101
fringeleaf paspalum	101
goldhair paspalum	101
hurrahgrass	101
littleseed paspalum	101
longhair paspalum	101
stiff paspalum	101
thin paspalum	101
Purpletop	103
Plumegrass	132

	Page
Saltgrass	
seashore saltgrass	105
Silkyscale	109
Switchgrass	107
Threeawn	
bottlebrush threeawn	111
Florida threeawn	113
longleaf threeawn	117
pineland threeawn	119
tall threeawn	121
Toothachegrass	123
Florida toothachegrass	123
toothachegrass	123
Uniolas	127
longleaf uniola	127
seaoats	127
spike uniola	127
MISCELLANEOUS GRASSES	129
SUMMARY OF GRAZING MANAGEMENT PRINCIPLES	133
MAJOR SITES OCCURRING IN FLORIDA	137
FOUR CONDITION CLASSES ON FRESH MARSH SITES	141
GLOSSARY	143
CHECK LIST OF ALL FLORIDA GRASSES	147
ALPHABETICAL LIST OF COMMON NAMES	159
REFERENCES	163

INTRODUCTION

"Important Native Grasses of Florida" has been compiled to meet a need in the field by Soil Conservation Service technicians, ranchers, and others in the field of native forage management.

A knowledge of plants, and especially grasses, is essential to the successful management of ranges and grazable woodlands in the Soil Conservation Districts of Florida. The native grasses of Florida have not been thoroughly appreciated. This has been largely due to a lack of knowledge concerning the individual grasses, their growth habits and seasonal preference by cattle.

Florida has approximately 15 million acres of rangelands and grazable woodlands that are being grazed by domestic livestock. The kind of grasses that are produced on these lands and the way they are used and managed in connection with improved pastures have an impact on the economy of beef cattle industry. Good animal husbandry practices are also important, because good grass management and good cattle compliment each other.

Information contained in this publication is based on detailed field observations of individual grasses. Regularly scheduled observations were made on relict areas, which have been undisturbed by grazing or fire, for several years. The natural growth and development of the grasses were noted. Several ranchers whose ranges and grazable woodlands were well managed provided valuable information on use and production. Over a period of four years information was collected on the distribution, site adaptation, reaction to grazing and management of the individual species. Observations were made on approximately 150 ranches representing slightly less than a million acres.

There are over 6,000 different grasses in the world but only a small number produce the major part of food for man and animals. Approximately 332 native grasses occur in Florida, of which 50 - 75 often occur in one soil conservation district. Of these, 12 to 15 usually produce most of the forage consumed by livestock while on the range or in the woods. For this reason, these plants have an economic value. A knowledge of these grasses also brings added pleasure and interest to everyone who is interested in the outdoors and especially to ranchers and SCS technicians, and other agricultural workers. A deeper appreciation develops with knowledge and understanding. This is especially true of grasses.

Grass management is not necessarily a modern concept. Some of the earliest written records of grass are found in the Old Testament of the Bible. The theme of grazing runs all through Genesis and Exodus, referring especially to Abraham and his nephew, Lot, in the land of Canaan. Three hundred years later, Jacob and his large operations were recorded. The tombs of Egypt with their contents and wall inscriptions testify to the importance of grass to man as early as 4000 BC

"..... In the matter of utility to man and beast, no plant or group of plants has ever played so great a part in the history of the world.....nor is the story of the merit of the grasses more than half told when it is related that they are man's bread and meat; many things good, and most things sweet.....though of all plants, the most common, the grasses are of all common plants, the least known." (W. J. Showalter, National Geographic Magazine, 1933).

PARTS OF A GRASS PLANT

To appreciate the different species of grass, we must first learn enough about them to distinguish one species from another. In other words, we must learn to recognize them as individuals that live and die, individuals that possess distinguishing characteristics. It is easier therefore, for anyone who wishes to be able to identify the different species of grass to learn the various parts of the plant. This is not as difficult as it may sound at first. No girl or boy learns to drive without learning the essential parts of the car.

Words like glumes, blade, spikelet and node are no more difficult to learn than brake pedal, steering wheel, carburetor, accelerator, clutch and gear shift. The reason for using botanical terms is the same as that for using the names of the different parts of a car; they are simpler and more exact than would be a descriptive phrase.

Plants may be annual or perennial.

Annual plants grow from seed each year.

Perennial plants put forth new growth from buds that form in the root crowns each year. Roots remain active for two or more years before they die and new roots take their place.

Roots of grasses are fibrous. The function of the roots is to take in nutrients and water from the soil. The roots also anchor the plant firmly in the ground.

Culm or Stems are usually hollow except at the nodes or joints. They may be erect, spreading or creeping. They may be single or freely branching. Branches are born at nodes in the axil of the sheath and stem.

Rhizomes are underground stems which are born at the base of the main culm underneath the ground. Rhizomes are jointed and bear scales which are reduced leaves. They grow horizontally under the surface of the ground. In due time they send up shoots which form new plants a distance from the parent plant. Roots develop at the under side of the nodes and help feed the new shoots.

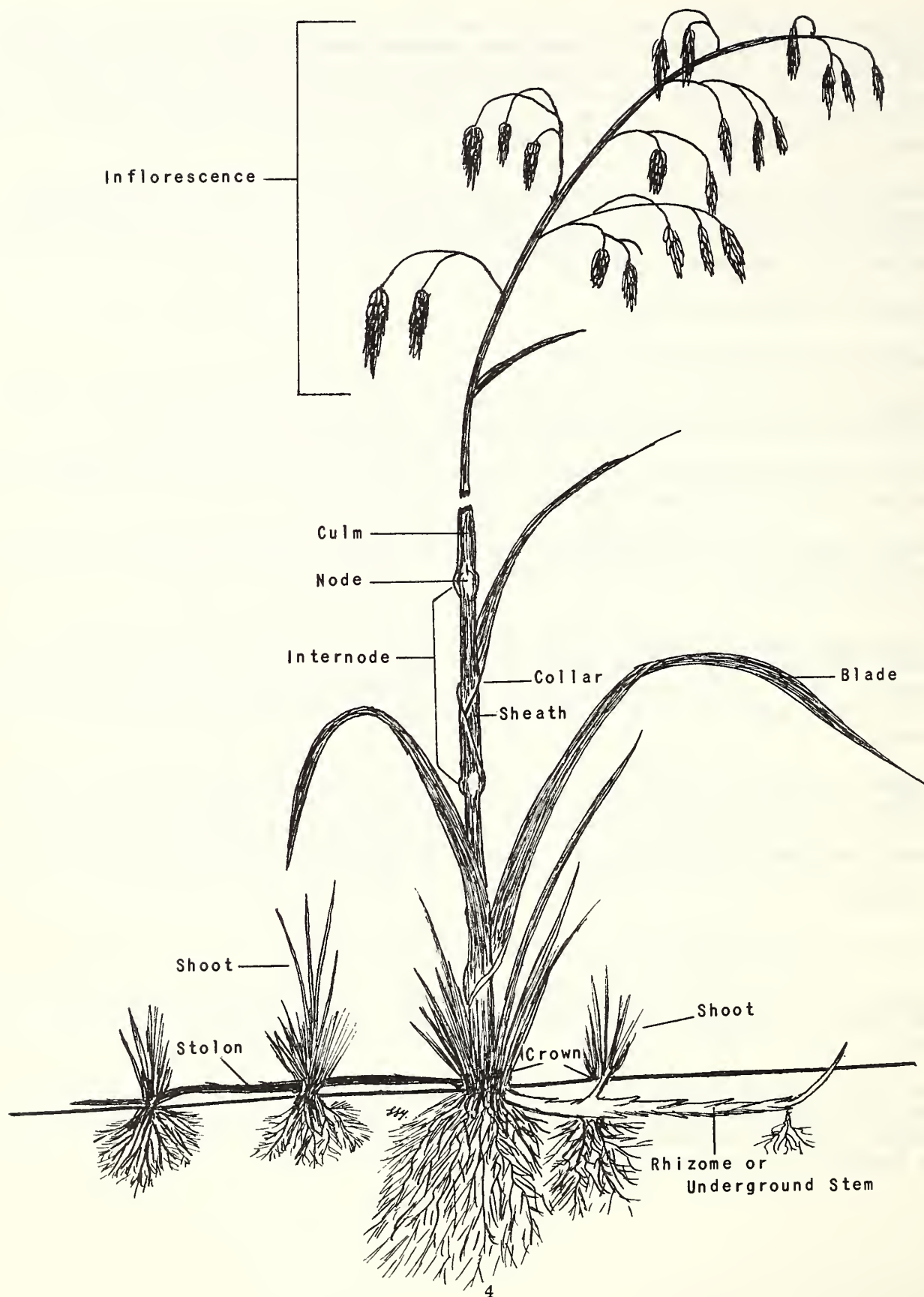
Stolons are shoots born at the base of the culm. These shoots run along horizontally on the surface of the ground instead of beneath it. Roots develop on the underside of the nodes where the nodes come in contact with the soil, and new shoots form on the top-side of the node to start a new plant. There is no real difference in the function of a stolon and a rhizome. The only difference is that one is above the ground and green, the other is below the ground and is not green.

The roots, stems, and leaves are the vegetative parts of the plant.

Leaves originate at the nodes and alternate on each side of the stem. They are parallel-veined and composed of three parts - blade, sheath and ligule. The ligule divides the sheath and the blade.

The sheath surrounds the stem like a tube. It is generally open, that is, split down one side, making it possible to separate the sheath from the stem without tearing the sheath. In some species of grasses, the sheaths are open, others are closed; in others, the sheaths are rounded on the back while others are flattened or compressed.

PRINCIPAL PARTS OF A GRASS PLANT



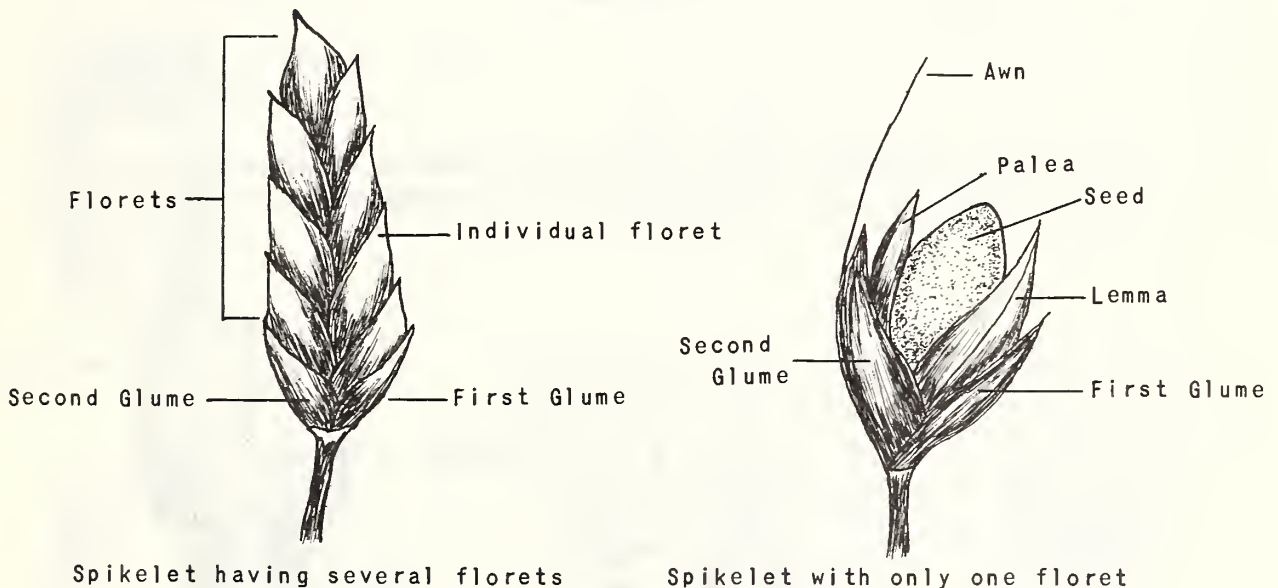
The ligule, meaning "little tongue" is sometimes called a "rainguard". It usually clasps the stem firmly which prevents dirt and water from fouling the sheath. The ligule is commonly thin textured, paper-like in appearance; sometimes it is only a ring of hairs. Some grasses have minute ligules or none at all.

The node is the location upon a grass stem which normally bears a leaf or a whorl of leaves; the solid construction in the culm of a grass. Leaves originate at the node. The internode is the space or distance between two nodes.

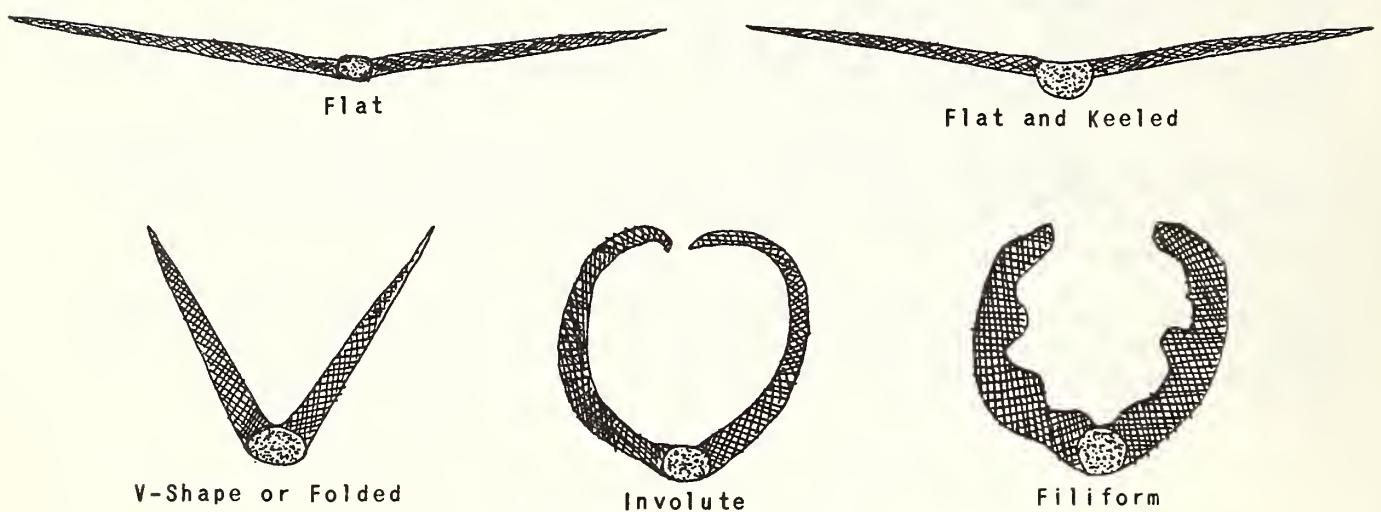
Culms are the jointed stems of a grass, usually hollow except at the node. Culms are frequently flattened, especially near the base.

The spikelet is a unit of the inflorescence. It consists of glumes and florets. The glumes and florets are always alternate. The florets or flowers are a unit of the spikelet. It is the individual flower that produces the single seed. The papery membranes around the seed are called the lemma and palea.

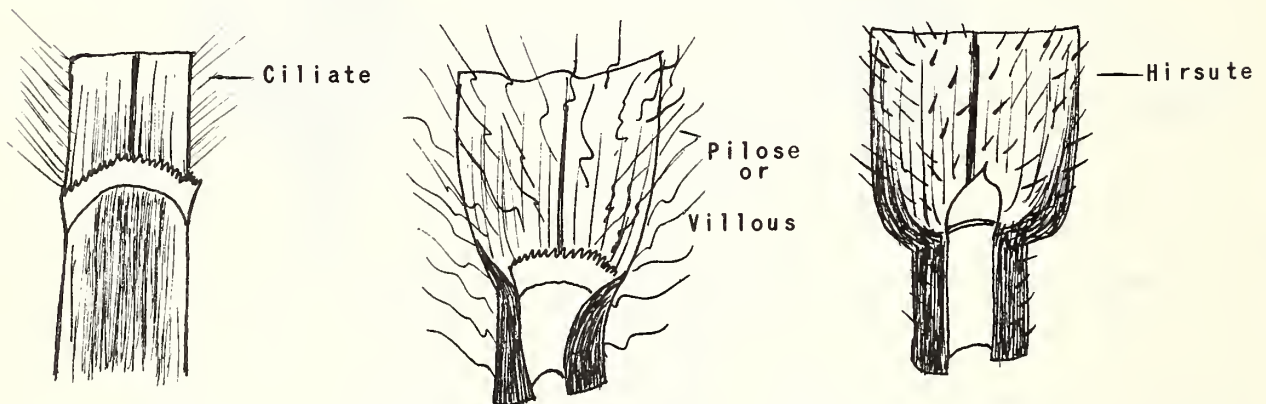
Spikelets vary in size. The number of florets may be reduced to one or increased to twenty or more. The glumes may be large and the florets small, or the florets large and the glumes small as the illustrations will bear out:

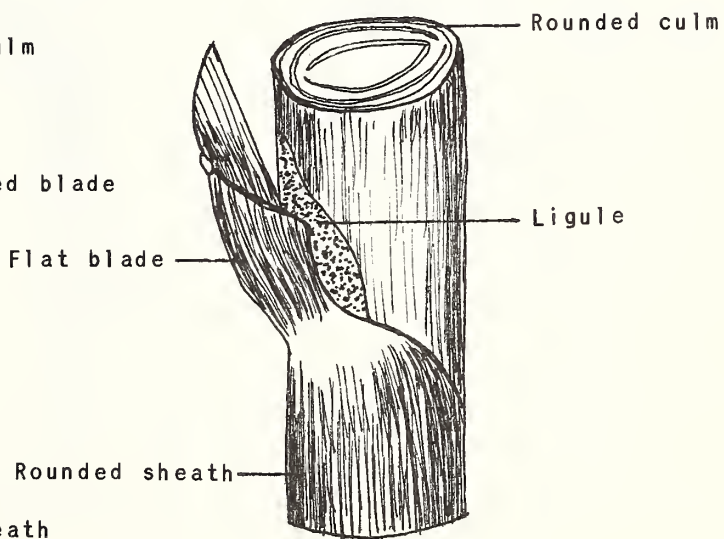
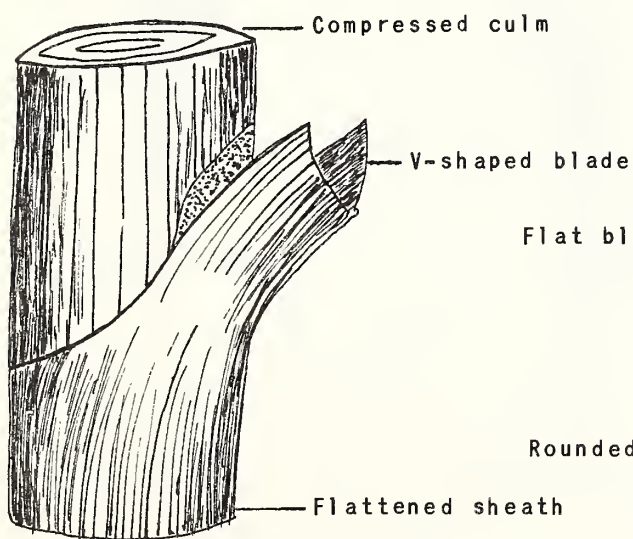
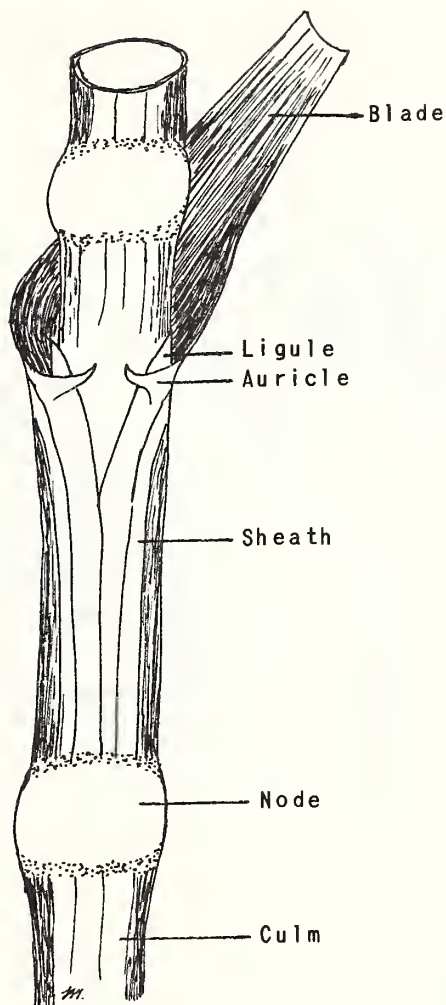
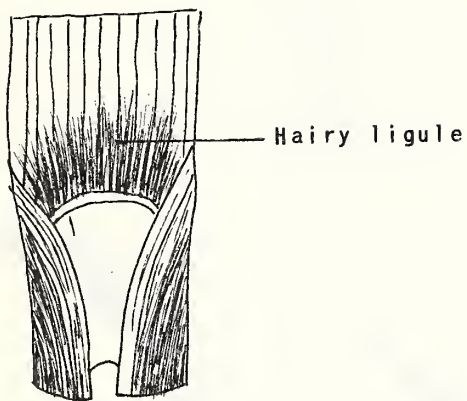
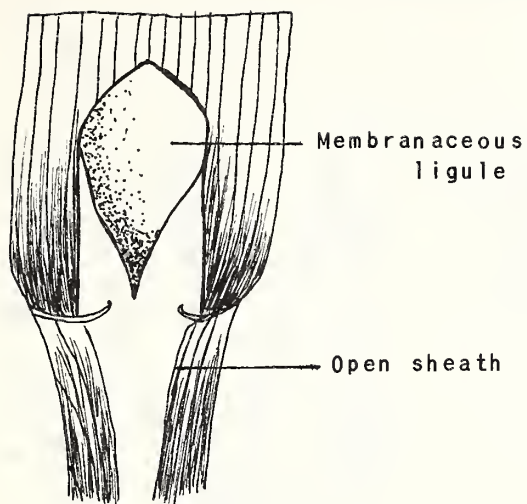


Grass blades are linear with parallel veins. In cross section, blades are flat, V-shaped, folded, keeled, filiforms or involute as shown by the following illustrations:



Various forms of pubescence or hair are frequently found on different parts of a grass plant. Most frequent are ciliate, pilose or villous and hirsute as illustrated:

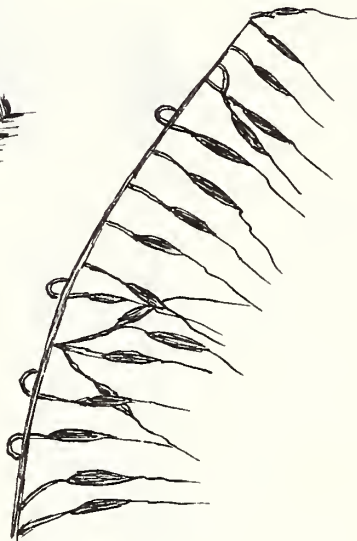




EXAMPLES OF COMMON INFLORESCENCES



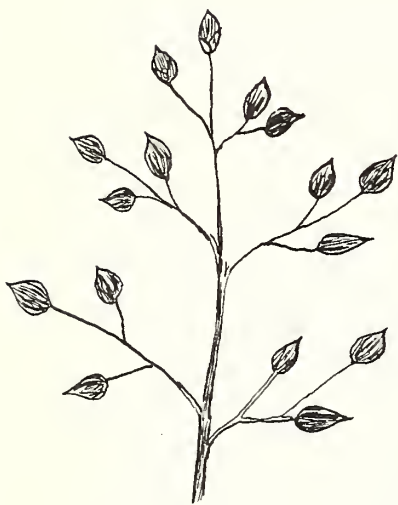
Bluestem



Indiangrass



Lovegrass



Panicum



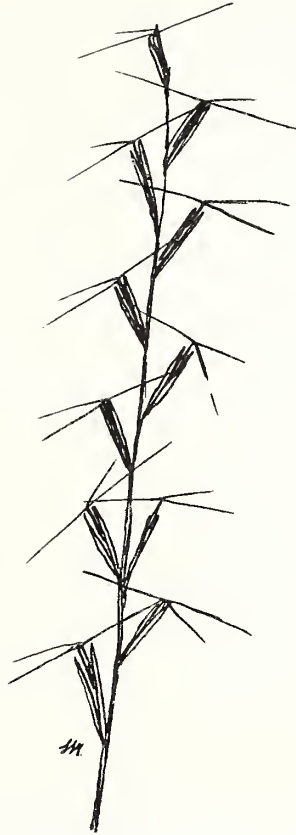
Paspalum



Toothachegrass



Chloris



Threeawn



Cordgrass



Bristlegrass



Carpetgrass

BARNYARDGRASS

Identification

Barnyardgrass (*Echinochloa crusgalli* var.) is an annual warm season grass, very robust and conspicuous. Several ecotypes occur which display considerable variation in stiff hairs on the spikelets, awn length, and density of the inflorescence and racemes. Culms are usually 4 to 6 feet tall with thick nodes. Blades 12 to 20 inches long, flat, with a thick heavy midrib. Upper side of midrib is white. Sheaths somewhat flattened with rounded keel. Inflorescence 10 to 14 inches long. Ligule absent. Another species *E. walteri*; or Coast cockspur closely resembles barnyardgrass, except for a more bearded panicle.

Distribution and Site Adaptation

Barnyardgrass is widely distributed in Florida with a wide variation of moisture and soil requirements. It is adapted primarily to extremely moist areas including edges of swamps, ditches, bottomlands and borders of organic marshes. Associated species are numerous, depending upon many soil and moisture conditions.



Barnyardgrass

F-742-12



Barnyardgrass growing in the swamp site

F-624-7

Growth Habits

Barnyardgrass and related species make vigorous growth during the period April through August. Seed germinate during the spring when the areas are free of standing water. Sufficient growth is attained by July and August that normal water accumulations do not hinder seed formation in September. Occasional seed heads are found in August. Barnyardgrass was introduced into the United States from the eastern hemisphere prior to 1900. Coast cockspur is a native. Both species are annuals. Their presence and production fluctuate rapidly in the plant composition on the sites where they are best adapted. Because they are not stable in the plant community they are classified as invaders.

Forage Value and Management

Both of these grasses produce considerable forage of fair quality. Neither can be depended upon from year to year to furnish the needed forage at a specific time. The large seed are of considerable value to birds.

BROOMSEDGE BLUESTEM

Identification

Broomsedge bluestem (*Andropogon virginicus*) is a warm season, perennial bunchgrass. Culms are 2 - 4 feet tall, inflorescence freely branched. Lower sheaths and stems are strongly flattened, pale yellowish-green color, and become papery at maturity. Leaves are flat or partly folded $\frac{1}{8}$ - $\frac{1}{4}$ inch wide with only a few scattered hairs at the base on the upper side. Ligule a fringed membrane $\frac{1}{16}$ inch long. Racemes are partly enclosed in a straw colored, leaf-like spathe. Spathe as long or longer than the raceme.

Distribution and Site Adaptation

Widely distributed throughout all of Florida and the southeastern United States. In Florida, broomsedge bluestem occurs on a wide variety of sites and soils. The following are sites on which broomsedge bluestem is considered to be a part of the potential plant community, and the more important species associated with it.



Broomsedge bluestem

F. 455-8

<u>Site</u>	<u>Associated Grass Species</u>
Acid and Sweet flatwoods	creeping bluestem chalky bluestem Florida bluestem Curtiss dropseed pinewood dropseed lopsided Indiangrass pineland threeawn blue maidencane
Slough	shortspike bluestem hairy bluestem toothachegrass pineland threeawn bluejoint panicum
Sand pond	longleaf threeawn maidencane
Sandhills	splitbeard bluestem Gulf bluestem Indiangrasses lovegrasses pineland threeawn creeping bluestem
Fresh marsh (mineral) Loamy Uplands	maidencane sand cordgrass big bluestem pinehill bluestem Indiangrasses little bluestem Elliott bluestem pineland threeawn
Sand scrub	Florida bluestem low panicums pineland threeawn

Growth Habits

Broomsedge bluestem begins new growth in south and central Florida by mid-January with main growth period usually from March through July. Seed is mature by late October. In north Florida, growth starts about 40 days later with seed maturity during September. Individual plants are weakly rooted. Optimum growth is made in full sunlight and up to 30 percent shade. The fertility requirement for broomsedge is low; therefore, it does well on sites low in inherent fertility, especially eroded, worn-out fields. The feathery seeds have a high germination and are carried by wind, livestock and vehicles, making it possible for seed to travel great distances in a short time.

Forage Value and Management

Nutritive qualities will vary depending on the soils. Dormant forage samples analyzed by the U. S. Forest Service in Louisiana show 4.85 digestible protein, .20 phosphorous and .05 calcium. Broomsedge furnishes considerable grazing during spring and early summer months on poor and fair ranges. During summer, fall, and winter months, forage values are very low.

Broomsedge bluestem is classified as an increaser on the majority of the sites where it occurs. On ranges in good or excellent condition, broomsedge contributes approximately 10 percent or less of the total herbage produced on the site. Where ranges are in poor and fair condition, broomsedge frequently contributes as much as 60 - 90 percent of the total herbage. Improved pastures are frequently invaded by broomsedge as soon as fertility levels are lowered.

Broomsedge bluestem is most palatable shortly after it grows up in spring. After seed head form, cattle leave it alone. It is grazed some during the dormant period if cattle are fed a protein supplement. The seed stalks and dry leaves supply energy food.

BUSHYBEARD BLUESTEM

Identification

Bushybeard bluestem (*Andropogon glomeratus*) is a large conspicuous grass producing leafy, bushy clumps 8 to 16 inches in diameter. This perennial, warm season grass has blades 6 to 24 inches long, 1/4 to 1/2 inch wide. Culms are distinctly jointed, often 1/4 inch thick, 3 to 5 feet tall, flattened at the base. Sheaths compressed, keeled, usually wider than the blades. Ligule a membrane 1/16 inch long. Inflorescence dense, feathery and very bushy, silvery white at maturity. Following maturity of seed and cool weather, entire plant turns to a tan or reddish color.

Distribution and Site Adaptation

Bushybeard occurs throughout Florida. It is particularly adapted to low, moist sites such as margins of swamps, marshes and sand ponds. It is especially conspicuous in road ditches, margins of pits and other disturbed areas where water accumulates. Does not commonly occur on the major sites, namely, the acid and sweet flatwood sites. It is, however, a conspicuous grass and indicates the combination of soil disturbance and water accumulation. For this reason it is considered an invader on all range sites.

Growth Habits

Major vegetative growth occurs from February through August. The tall conspicuous bushy inflorescences are produced in early September. Seed are mature by the first of November in South Florida. Extremely wet summers appear to hasten the formation of seed and maturity of the plant.

Forage Value

Bushybeard is not an important forage species on any site where it may occur. Frequently, bushybeard is utilized by cattle during spring months and occasionally during early summer months. Forage value is generally considered to be poor and very little, if any, forage value during summer, fall or winter months.



Bushybeard bluestem

F-745-1

CABANIS BLUESTEM

Identification

Cabanis bluestem (*Andropogon cabanisii*) is a warm season, perennial bunchgrass. Culms frequently 4 - 6 feet tall from small tufts. Culms purplish-red at maturity. Blades generally flat 1/4 inch wide, 12 - 16 inches long, nearly glabrous. Sheaths rounded. Ligule a distinct membrane 1/8 inch long. Racemes paired, silky white, 2 1/2 - 3 inches long.

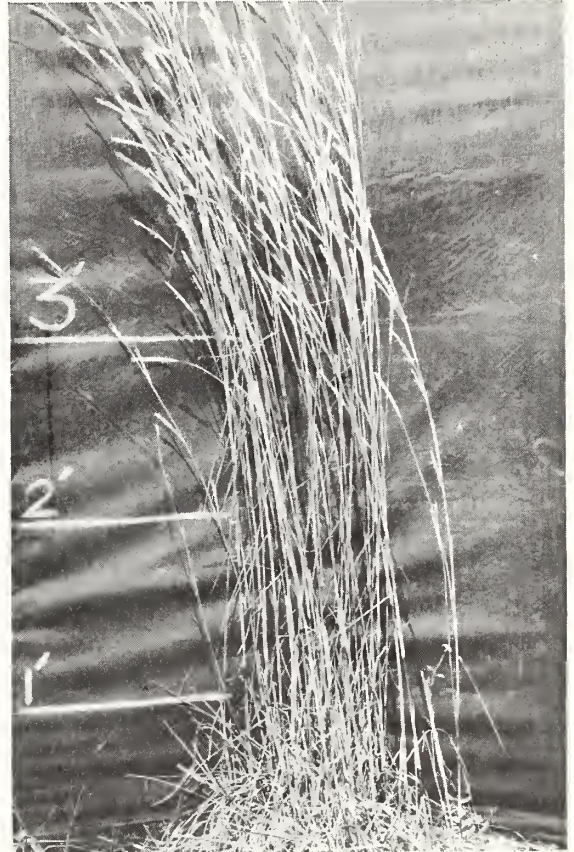
Distribution and Site Adaptation

Cabanis bluestem occurs primarily in South and Central Florida, rarely North of Orlando. As a part of the climax plant community, the following site and species relationships exist:

<u>Site</u>	<u>Associated Grass Species</u>
Sweet and Acid flatwoods	creeping bluestem Florida threeawn chalky bluestem lopsided Indiangrass pineland threeawn blue maidencane switchgrass

Growth Habits

New shoots are produced in February and March. Major growth is from March through August. During September, the tall purplish culms are produced which bear the silky white racemes. The paired racemes appear as one for considerable time and separate only at seed maturity during early October. Several fruiting culms are produced per plant. A vigorous individual plant clump is normally 4 - 6 inches in diameter at the soil surface. Rarely occurs in pure stands.



Cabanis bluestem

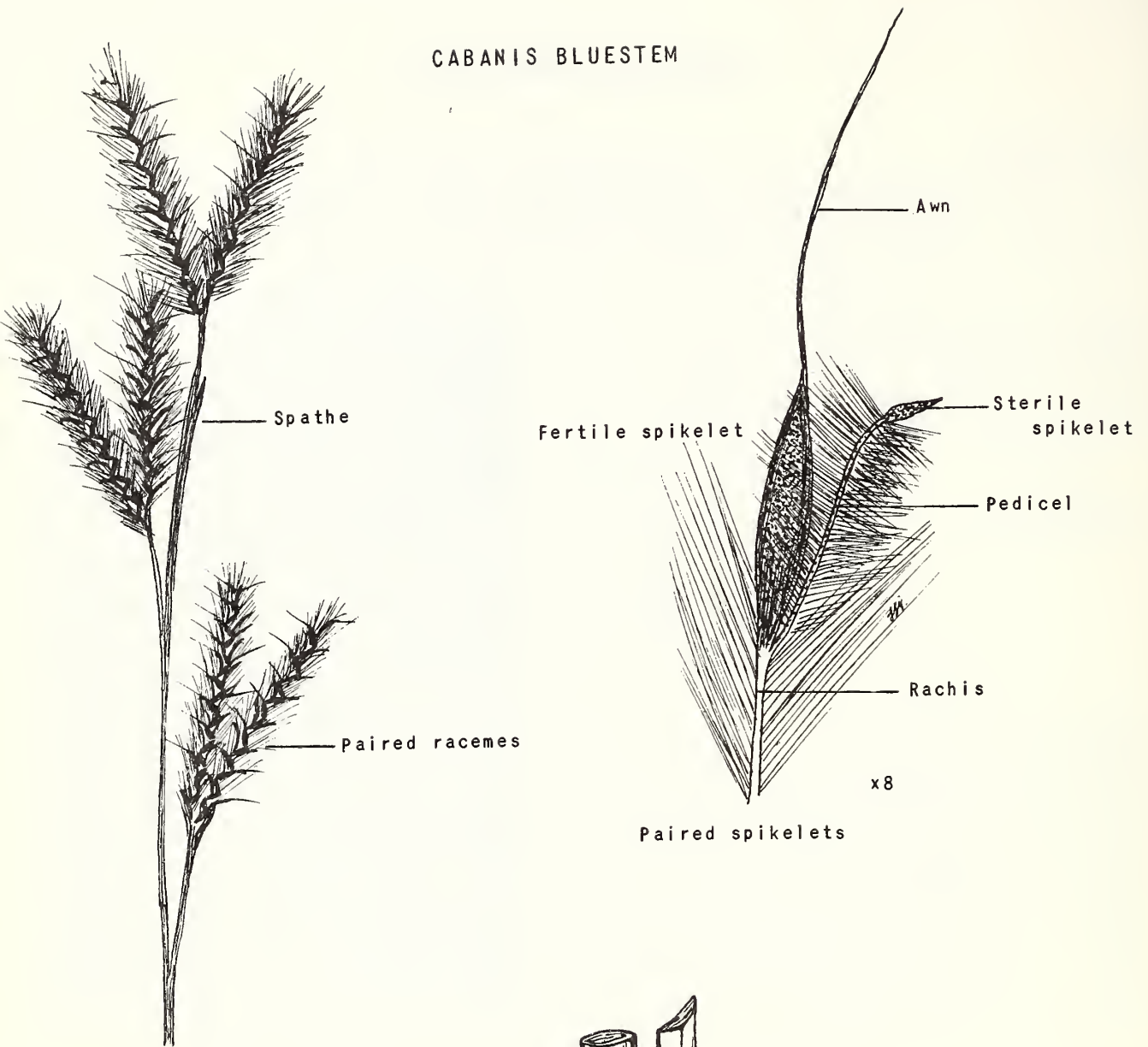
F-755-B

Forage Value and Management

Cabanis bluestem is classified as a decreaser on all sites where it occurs. On heavily grazed flatwood sites, Cabanis bluestem may be found in and around saw palmetto and other woody plants where it is being protected from grazing. Although not a major grass, the presence or absence of the species is an excellent indication of the intensity of past grazing management.

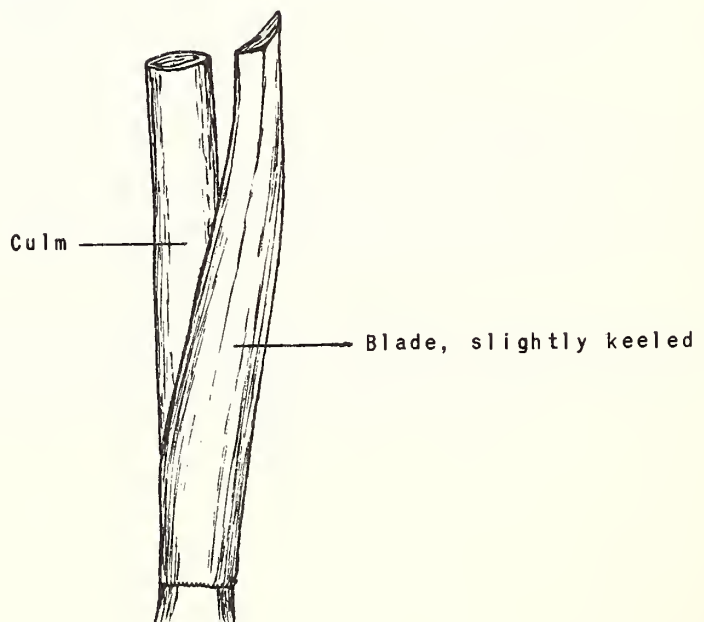
Only a small amount of the total herbage produced on good and excellent ranges is from Cabanis bluestem. Extremely palatable, it is readily selected by cattle throughout the entire growing season. The same management practices used to encourage the growth of creeping bluestem will likewise increase the amount of Cabanis bluestem.

CABANIS BLUESTEM



Paired spikelets

Branchlet of inflorescence



CHALKY BLUESTEM

Identification

Chalky bluestem (*Andropogon capillipes*) is a perennial bunchgrass. Vigorous mature plants are often 6 - 8 inches in basal diameter. Blades are folded sharply and keeled at the base but flattened toward the tip. Sheaths are keeled. Culms, sheaths and blades are conspicuously chalky-glaucous which rubs off easily. Ligule a membrane 1/16 inch long. Seed stalks usually 3 - 5 feet tall. Basal blades 20 - 25 inches long and 1/2 inch wide.

Distribution and Site Adaptation

Distributed throughout Florida with major importance in the south and central Florida regions. Chalky bluestem is a part of the total plant community with the following relationships:

<u>Sites</u>	<u>Associated Grass Species</u>
Acid and Sweet Flatwoods	creeping bluestem Florida threeawn pineland threeawn broomsedge bluestem Florida paspalum lopsided Indiangrass switchgrass
Seepy Slopes (Highlands + Polk SCD's)	creeping bluestem cutthroat grass beaked panicum
Fresh Marsh (Mineral)	maidencane cutgrasses
Sand Ponds (margins)	maidencane tall threeawn broomsedge bluestem



Chalky bluestem

F-761-11

Growth Habits

Chalky bluestem begins growth in mid-January in the southern portions of Florida and about 30 days later in northern parts of the state. Vigorous plants will produce 8 - 10 inches of basal growth by the first week in March. Grand growth period extends from March through July in South Florida. Seed stalks appear during September and early October; seed ripens during November. Previous season's basal growth frequently remains green despite 20 - 25°F temperature during January. Natural deterioration of old growth commences during February and March.

Forage Value and Management

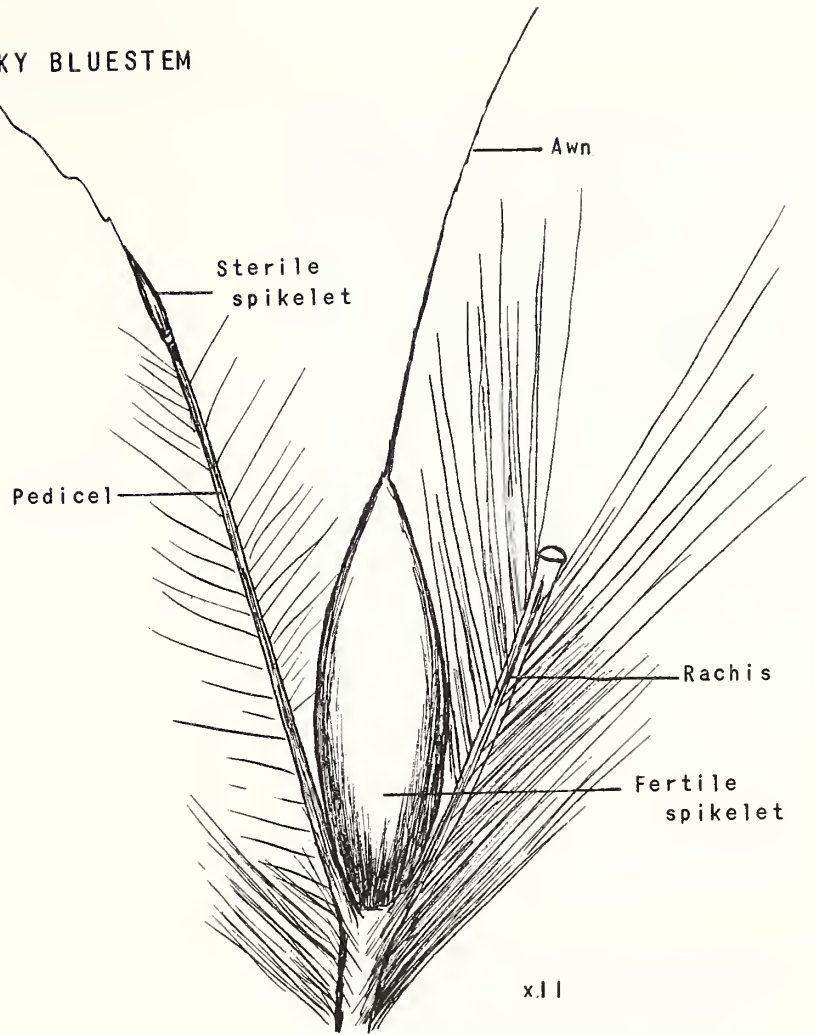
On flatwood sites in good condition, chalky bluestem contributes approximately 10 - 15 percent of the total herbage. Evidence of a high production of viable seed is substantiated by numerous seedlings on deferred ranges and recently vacated areas of sub-divisions and rights-of-way. On cultivated muck lands, chalky bluestem establishes itself readily and forms pure stands following one or two years of non-use.

This is considered the most palatable native grass in Florida on the flatwood sites. It is grazed yearlong. Together with creeping bluestem, it provides excellent roughage for winter use. Flatwood sites show an immediate increase in the amount of chalky bluestem when deferred during the grand growth period. Immediate response in vigor is likewise obtained through deferments. With excessive grazing pressure, this grass is one of the first to disappear and be replaced by less desirable species. Therefore, chalky bluestem is classified as a decreaser on all range sites where it occurs.

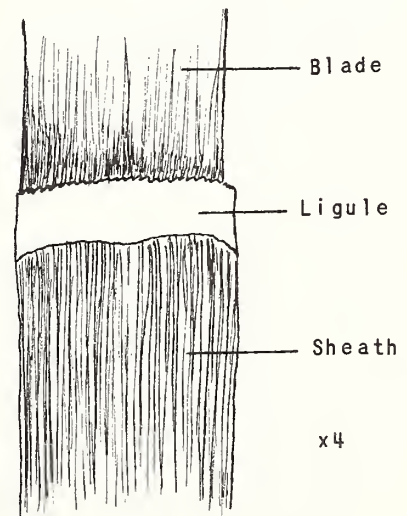
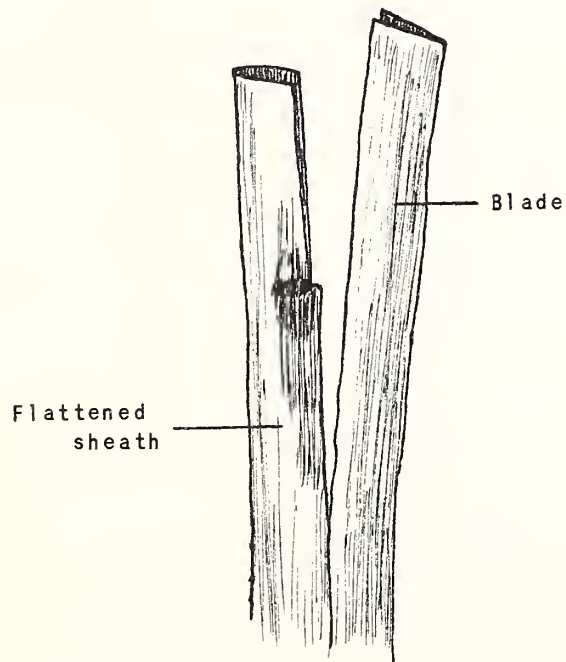
CHALKY BLUESTEM



Branchlet of inflorescence



Paired spikelets



CREEPING BLUESTEM

Identification

Creeping bluestem (*Andropogon stolonifer*) is a warm season perennial, forming dense colonies or sod from extensively creeping scaly rhizomes. Leaf blades are 1/4 to 3/8 inch wide, often 24 inches long, V-shaped or flat and taper abruptly at the tip. Sheaths strongly flattened, often with a slight purplish tinge near the base. Base of blade, collar and upper part of sheath densely villous to sometimes glabrous. Culms are 2 to 6 feet tall single or only a few to a colony. Inflorescence frequently 2 feet long, much branched with racemes 1-1/2 inch long, slightly drooping at maturity. A light colored, glaucous form occurs in the Gulf, Pasco and Hillsborough SCD's.

Distribution and Site Adaptation

Creeping bluestem occurs throughout Florida on a wide range of sites. It is particularly adapted to the following sites where it is a major component of a stable plant community:

<u>Site</u>	<u>Associated Grasses</u>
Acid flatwoods	lopsided Indiangrass chalky bluestem pineland threeawn cutthroat grass (Highlands & Polk SCD's) broomsedge bluestem toothachegrass Curtiss dropseed hairy panicum
Sweet flatwoods	Florida threeawn Florida paspalum pineland threeawn chalky bluestem hairy panicum switchgrass
Sandhills	lopsided Indiangrass pineland threeawn switchgrass Gulf bluestem splitbeard bluestem
Loamy upland	big bluestem switchgrass Indiangrass slender bluestem



Creeping bluestem

F-465-6



Colony of creeping
bluestem

F-742-3

Growth Habits

Growth commences the first week in January in South Florida and by early March in North Florida. Leaf blades usually reach 4 inches the first 5 weeks of growth. By late July, major growth has been attained and the grass begins to form seed stalks. Bloom occurs in late August or September and seed maturity in October. Frequently, previous year's foliage remains green throughout the winter months in the southern part of the state. Leaf blades are often 17 months of age before dying back. Low temperatures of 25-30°F do little damage to new basal growth when partially protected by moderate amounts of rough. Some rhizomes are produced during December and January. Rhizomes elongate as much as 12 to 14 inches in a single growing season. Small plants of creeping bluestem, low in vigor, produce one or two tall seed stalks the first growing season of a deferment. This is also characteristic growth following a brush control practice with a deferment. During succeeding years with good management, basal growth and rhizome elongation increases. Seed production is uncertain and erratic.

Forage Value and Management

The majority of the grasses on the flatwoods site are equally palatable during spring months. By late May and June, sharp differences occur, primarily between pineland threeawn and creeping bluestem. Cattle continue to select creeping bluestem throughout the growing season and leave pineland threeawn to mature and complete its growth requirements. Creeping bluestem is classified as a decreaser on all sites where it occurs. Creeping bluestem is usually found within the protection of saw palmetto on poor and fair condition class ranges. Deferments during the growth period from early spring until after seed maturity will permit the reestablishment of plant vigor, permit rhizome growth and new shoots to develop. Graze only 50 percent of the current season's growth, by weight, for proper use. Creeping bluestem is one of the most valuable native grasses in Florida. Excellent forage is available from this grass year long. It is excellent for winter roughage when supplemented with protein.

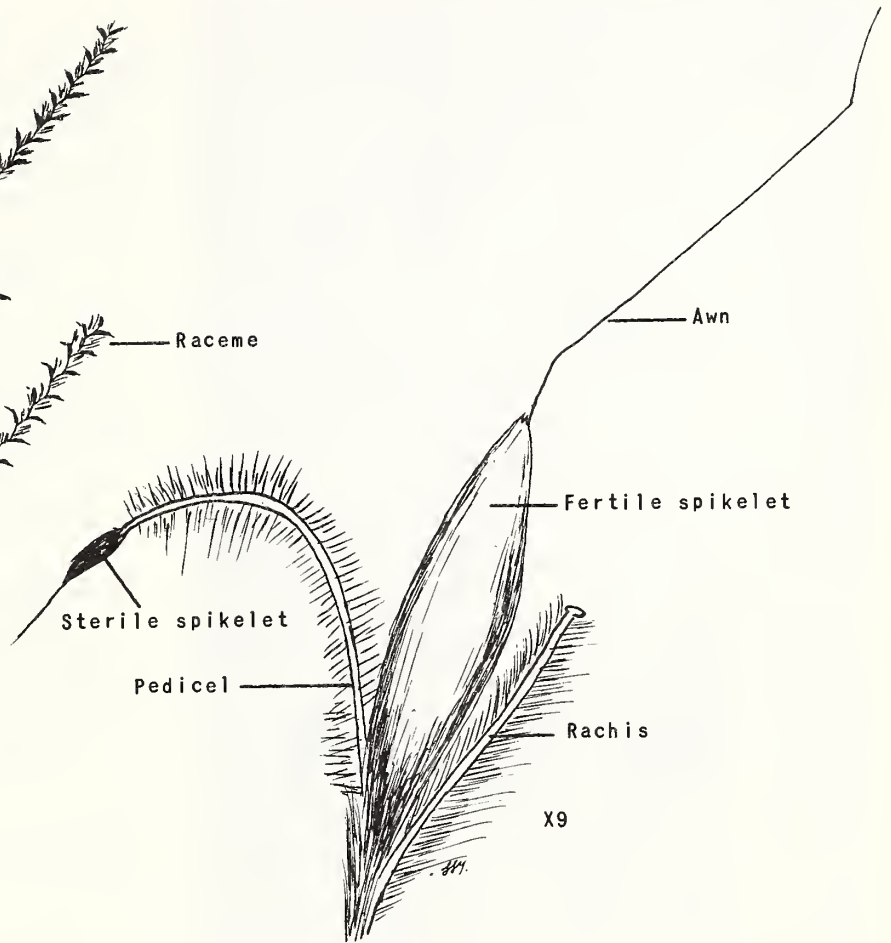
Forage is efficiently produced under a 25-35 percent crown canopy of a pine forest. Greater shade sharply reduces production. Good condition ranges on sites where this species occurs usually have 50-60 percent of the total herbage being produced by creeping bluestem. Production under these circumstances averages 2,000 pounds air dry forage per acre.

Results of three years comparative observations at the Plant Material Center, Arcadia, Florida, showed that creeping bluestem equaled or exceeded the forage production of both pangola and Bahiagrass under the low level of fertilization.

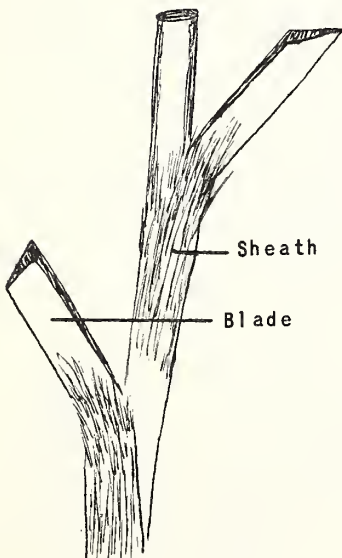
CREEPING BLUESTEM



Branch of inflorescence



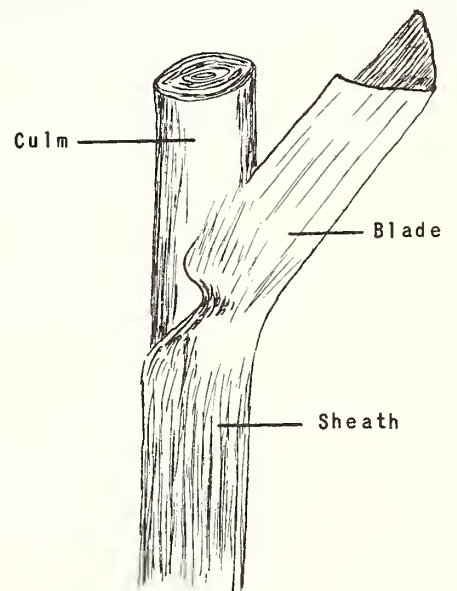
Paired spikelets



Basal blade and sheath



Cross section of blade
X7



Upper sheath and blade

HAIRY BLUESTEM

Identification

Hairy bluestem (*Andropogon longiberbis*) is a warm season perennial bunchgrass. Culms erect, 2 - 3 feet tall. Sheaths crowded, strongly compressed, long villous. Blades folded at the base, flattened towards the tip, 12 - 14 inches long, villous the entire length. Racemes 2, copiously long villous. Spathe slightly exceeding the racemes, light brown at maturity.

Distribution and Site Adaptation

Distributed throughout Florida with major importance in south and central portions. Hairy bluestem is associated with the following species as a part of the total plant community on the following site:

<u>Site</u>	<u>Associated Grass Species</u>
Slough	blue maidencane
	bluejoint panicum
	shortspike bluestem
	pineland threeawn
	toothachegrass

On other sites hairy bluestem occurs only sparingly and not important in evaluating the forage resource.

Growth Habits

Growth begins in early January from crown buds and grows rapidly until late May or early June. Basal leaves usually attain a height of 12 to 14 inches. Seed stalks appear in late May and June. Seed mature by late June. Accumulation of water during July and August on the site where hairy bluestem occurs, apparently prevents regrowth during the last part of growing season.

Forage Value and Management

Hairy bluestem is considered a decreaser on the slough site. Due to its apparent high palatability it is readily selected by cattle during early spring and early summer months when water levels are low in the slough site.

Per acre yields are unknown since pure stands do not exist. Hairy bluestem probably contributes as much as 30 - 40 percent by weight of the total herbage of the slough site in top part of good range condition. Slough sites are usually heavily grazed in late winter and early spring months following a burn, as a result hairy bluestem is grazed severely during the grand growth period. Good management practices will provide for deferments to pastures where the slough site is the major forage producing site. This deferment period should be during the grand growth period of February through June.



Hairy bluestem

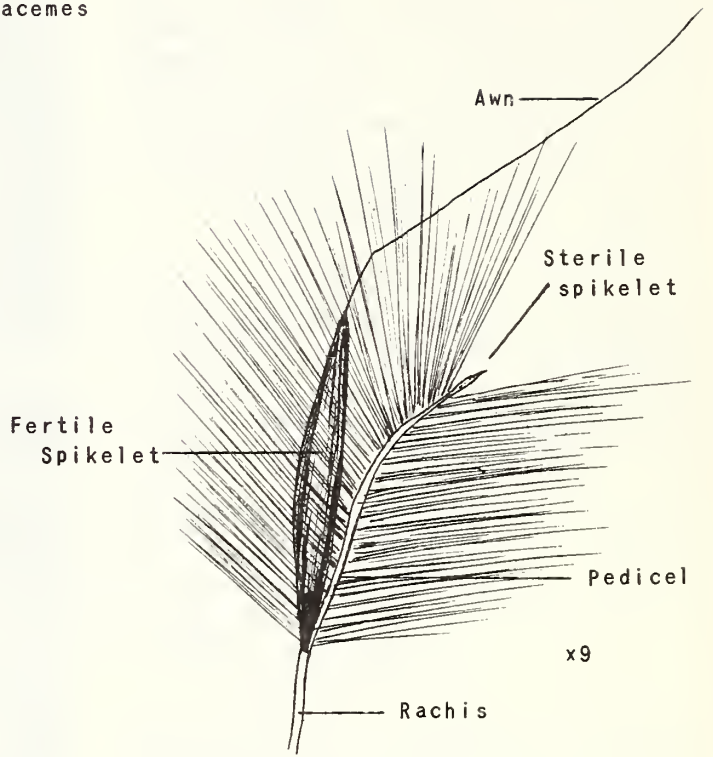
F-731-7

HAIRY BLUESTEM



Paired racemes

Branch of inflorescence



Awn

Sterile spikelet

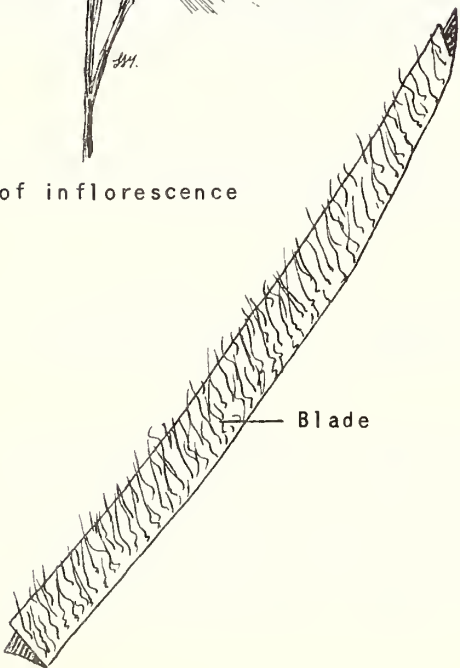
Fertile Spikelet

Pedicel

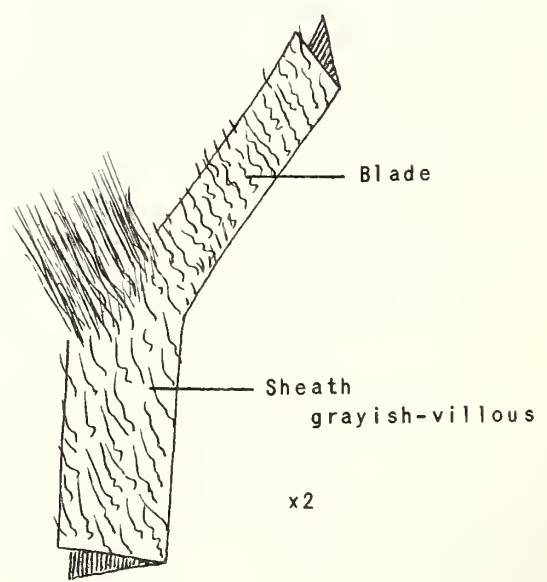
x9

Rachis

Paired spikelets



Blade



Blade

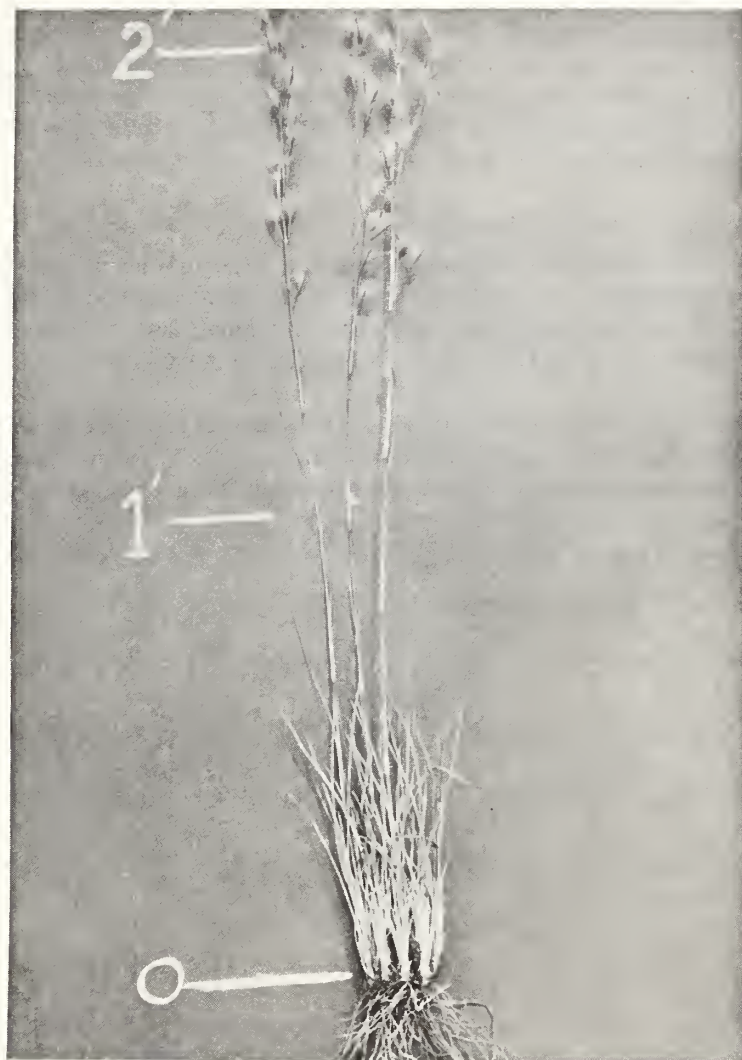
Sheath
grayish-villous

x2

PURPLE BLUESTEM

Identification

Purple bluestem (*Andropogon virginicus* var. *glaucopsis*) is a perennial, warm season bunchgrass similar in appearance to chalky bluestem but much smaller. Culms 18 - 30 inches tall, purple. Sheaths crowded at the base, flattened; blades fine, narrow, 6 - 8 inches long, both very glaucous. Racemes paired, villous, partially enclosed in a purple spathe. Individual plants 3 - 4 inches in diameter at the base. Although a small grass, purple bluestem is very conspicuous among other grasses.



Purple bluestem

F-677-12

Distribution and Site Adaptation

Purple bluestem occurs throughout Florida with primary distribution in central and southern parts of the state. It is particularly adapted to the drier phases of the acid and sweet flatwood sites and is associated with the following grass species:

creeping bluestem	broomsedge bluestem
pineland threeawn	Florida threeawn
switchgrass	blue maidencane
chalky bluestem	lopsided Indiangrass

Growing Habits

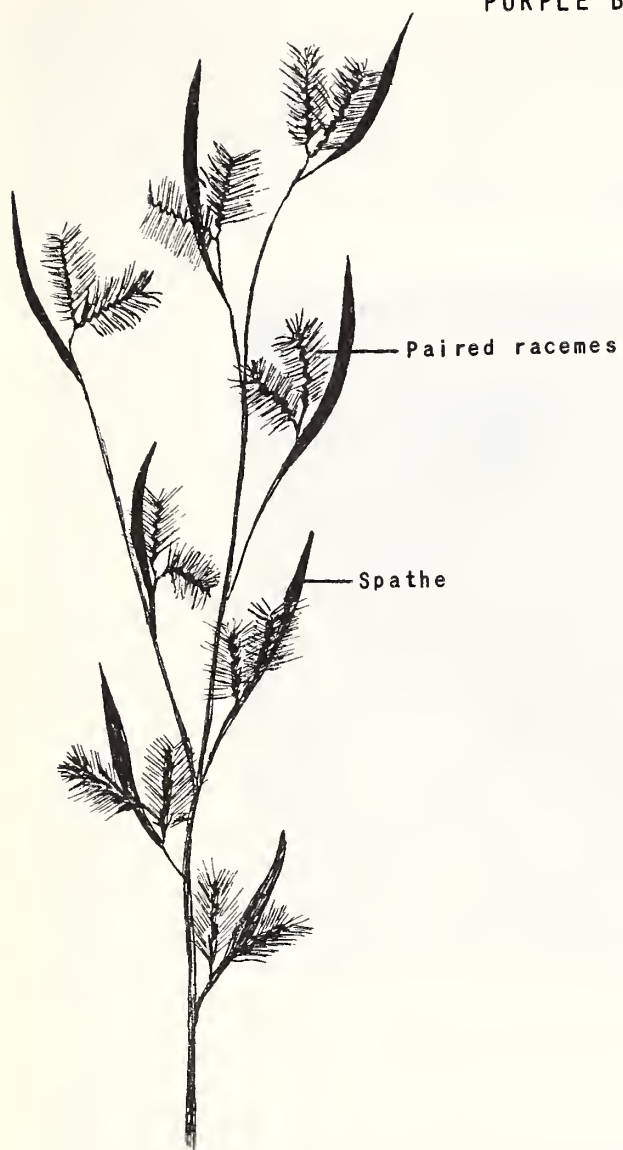
Basal growth starts in January and February and continues through August and September. Fruiting culms and inflorescences do not appear until early October and by mid-November seed are mature. Green growth remains within the base throughout much of the year. Numerous seedlings are usually observed where plants have been allowed to produce seed the previous fall indicating fair to good seed production and germination.

Forage Value and Management

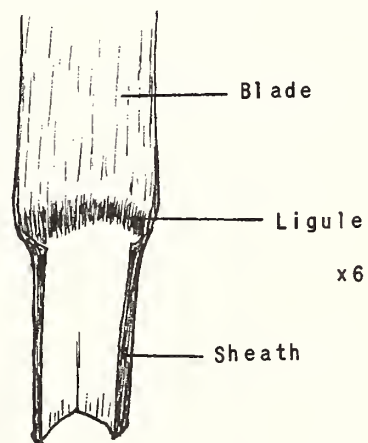
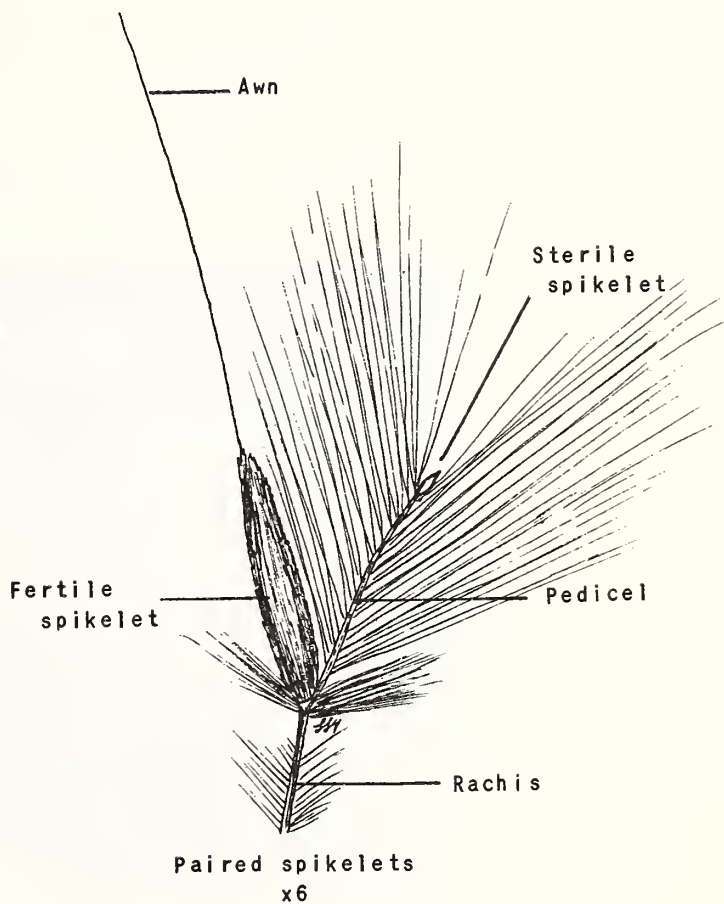
Purple bluestem responds to grazing pressure as an increaser on both sites where it occurs. Occasionally, a nearly pure stand of purple bluestem may be observed where the combination of both heavy grazing and excessive drainage has influenced the composition. As an increaser, purple bluestem represents only a small percentage of the total potential plant community.

Careful selection by cattle of this grass indicates its apparent high palatability which continues from early spring until late fall. Insufficient volume of forage is generally produced by purple bluestem to warrant it a species upon which to base management. Deferred grazing, proper range use and other good range management practices will encourage purple bluestem to maintain vigor and provide the needed variety in the range diet for cattle.

PURPLE BLUESTEM



Branch of inflorescence



SOUTH FLORIDA BLUESTEM

Identification

South Florida bluestem (*Andropogon rhizomatus*) is a warm season perennial, spreading from short slender rhizomes. Culms 2 to 4 feet tall, few. Sheaths rounded, slightly keeled, longer than the internode. Blades 8 - 14 inches long, 1/8 to 1/4 inch wide, flat or slightly rolled. Sheaths and blades glabrous. Inflorescence 10 - 16 inches long, thin, open. Racemes 1½ to 4 inches long, strongly curved. Spathe very small, inconspicuous. Ligule a membrane, 1/16 inch long. Colonies of South Florida bluestem have a characteristic bluish color.



F. 742-9

Normal growth of South Florida bluestem, Plant Material Center, Arcadia, Florida.

Distribution and Site Adaptation

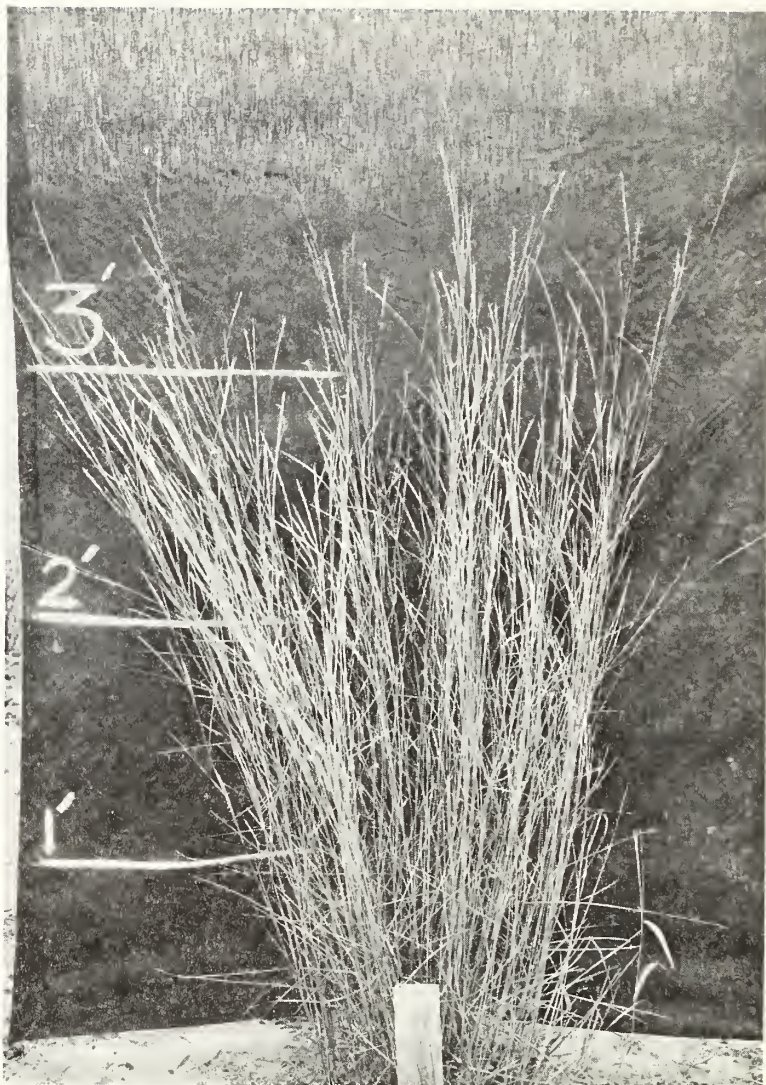
Observations indicate that South Florida bluestem is distributed southward from a line extending from DeSoto to Martin County. It is primarily adapted to the soils and sites where marl and limerock are present. These are mainly sweet flatwoods and rockland. On these sites South Florida bluestem is an important specie in a stable plant community and occurs with the following associated grass species: creeping bluestem, Florida and brownseed paspalum, switchgrass, tall threeawn, chalky bluestem, blue maindencane, and gulfdune paspalum.

Growth Habits

The grand growth period of South Florida bluestem occurs from January through September. Major vegetative growth is completed by mid-August at which time seed heads are formed. Seed production appears very low. Major spread is from extensively creeping rhizomes. Rhizome growth occurs during December and January when new shoots are formed for early spring growth. Additional rhizomes are produced during summer months. 16° and 18° F. temperature at the Arcadia Plant Materials Center, December 12 and 13, 1962, had little effect on the still green basal growth.

Forage Value and Management

Observation of ranges in poor condition show this bluestem to be found within the protection of saw palmetto and other woody plants. Relict areas along Highway 832 east of Devils Garden Fire Tower have South Florida bluestem as a major part of the plant community. Good condition ranges of the Alico Land and Development, LaBelle, Florida, and Babcock Florida Co., Punta Gorda, both have this bluestem as a part of the composition. Observations indicate South Florida bluestem to be very palatable and readily grazed by cattle. South Florida bluestem is classified as a decreaser on all sites where it occurs. Natural occurrence on soils influenced by marl or limerock greatly improves the nutritive value of this species. Deferred grazing on poor and fair condition ranges during the grand growth period permits South Florida bluestem to regain vigor and spread. Any mechanical or chemical brush control measures must be followed by deferred grazing and proper use.



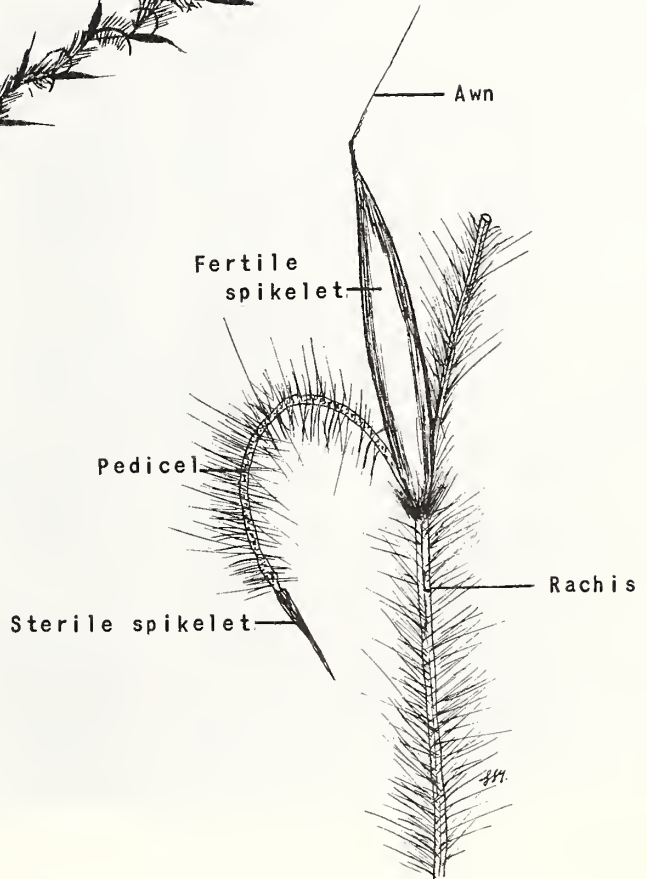
South Florida bluestem

F-748-11

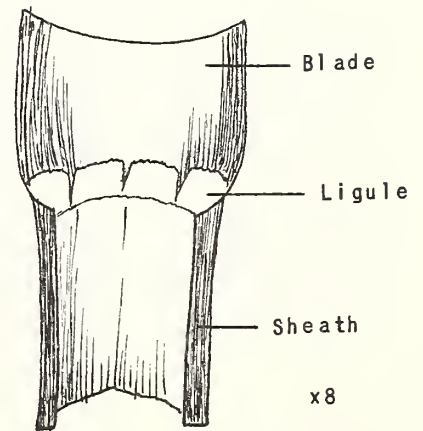
SOUTH FLORIDA BLUESTEM



Branch of inflorescence



Paired spikelets



SPLITBEARD BLUESTEM

Identification

Splitbeard bluestem (*Andropogon tenarius*) is a warm season perennial bunchgrass. Leaves usually 12 - 16 inches long, often slightly purplish-glaucous. Blades 1/8 - 1/4 inch wide, flat but folded when dry. Upper sheaths rounded, lower sheaths slightly flattened and keeled, loosely and sparingly villous. Culms 2 - 3 feet tall; inflorescence elongate and loose. Racemes paired, 2 inches long, nearly white on long peduncles. Spikelets long villous. Spathes inconspicuous. Ligule a membrane, 1/16 inch long.

Distribution and Site Adaptation

Splitbeard bluestem occurs throughout the central Florida ridge, north Florida and into western regions of the state. It is primarily adapted to the Sandhill site where it is associated with the following: Gulf bluestem, pineland threeawn, Indiangrass, hairy panicum and blackseed needlegrass.



Splitbeard bluestem

F-726-7

Growth Habits

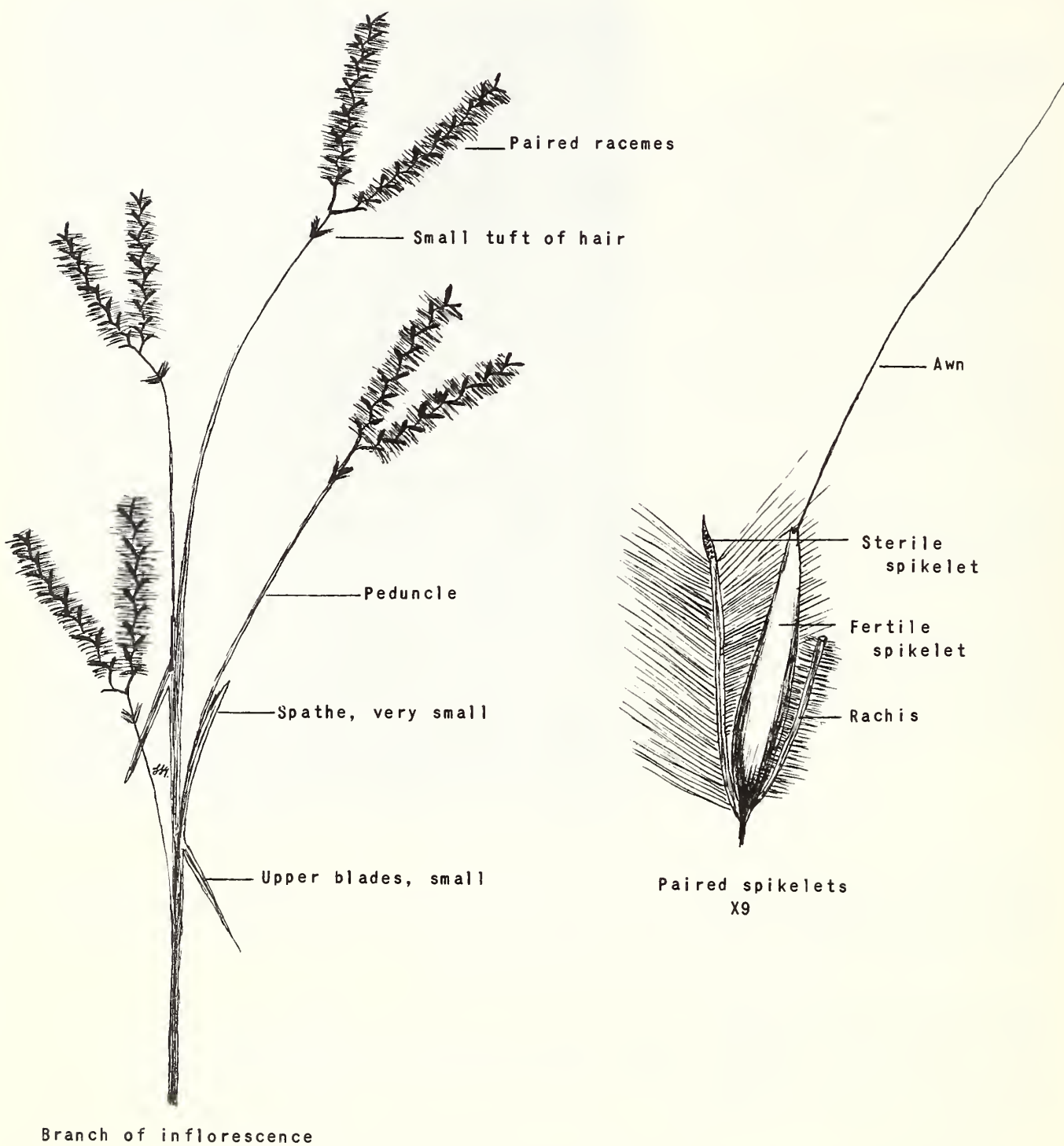
The main growth period is from March or April through June or July. Flowering and seed maturity occurs during May and June. An occasional second growth may occur during September and October with seed formation in November.

Forage Production and Management

Splitbeard bluestem is a decreaser on the Sandhill site where it is an important species in the stable understory plant community. Due to its high palatability during spring and summer months, livestock have overgrazed this grass and allowed the less desirable pineland threeawn to maintain its vigor and increase.

As a component part of a stable plant community, splitbeard contributes approximately 10 - 20 percent of the total herbage production of the understory. Close examination of ungrazed relict areas indicate the importance of splitbeard on the sandhill site. It is unlikely, however, that splitbeard would be used as the species upon which to base management.

SPLITBEARD BLUESTEM



BLUE MAIDENCANE

Identification

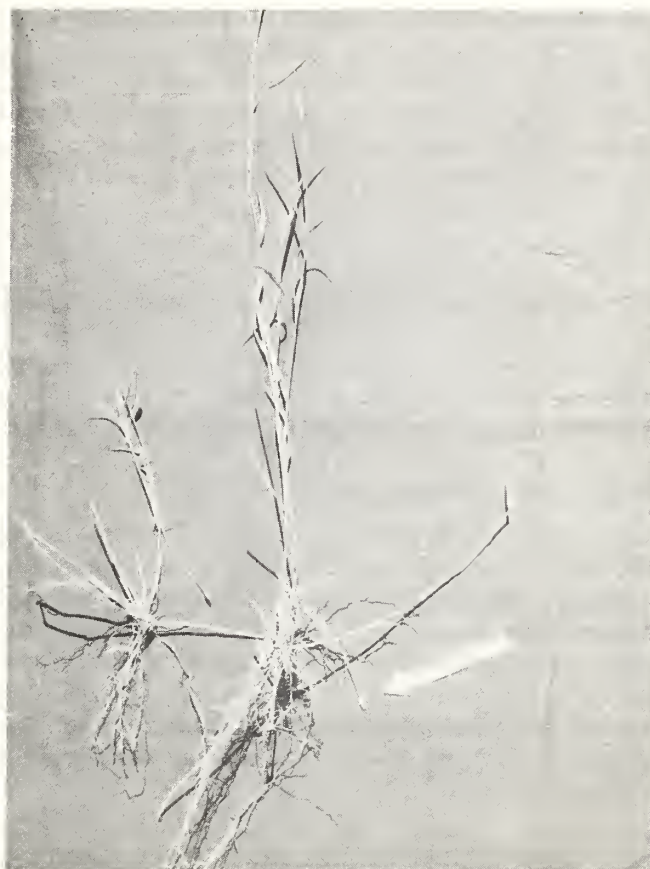
Blue maidencane (*Amphicarpum muhlenbergianum*) is a warm season perennial with a very extensive rhizomatous root system. Blades are flat and firm, 3 - 5 inches long, 1/4 - 1/2 inch wide with rough margins which frequently become white at maturity. Sheaths rounded on back. Seed stalks 1 - 3 feet tall. Inflorescence a few-flowered open panicle 2 - 4 inches long. Leaves evenly distributed on culm. Basal leaves mostly absent.

Distribution and Site Adaptation

Blue maidencane is distributed throughout Florida, extreme southern Georgia and South Carolina. Distribution is centered in South and Central Florida and northward through the eastern half of the state into Clay and Putnam Soil Conservation Districts. Recognized as a part of the total plant community, blue maidencane has the following site and species relationships:

Site	Associated Grass Species
------	--------------------------

Acid	creeping bluestem
Flatwoods	broomsedge bluestem
and Sweet	chalky bluestem
Flatwoods	Florida threeawn
	pineland threeawn
	switchgrass
	lopsided Indiangrass
Slough	Florida threeawn
	shortspike bluestem
	pineland threeawn
	hairy bluestem
	bluejoint panicum



Blue maidencane

F-544-2



Normal growth of blue maidencane. Plant Materials Center, Arcadia, Florida.

F-739-4

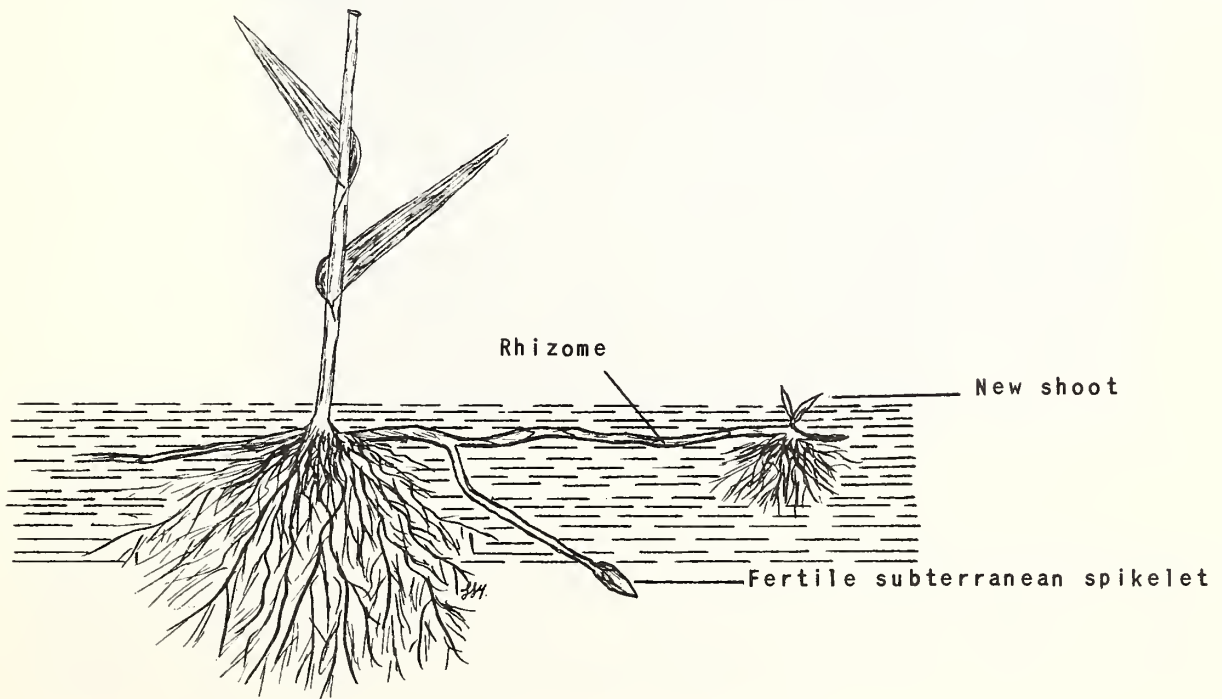
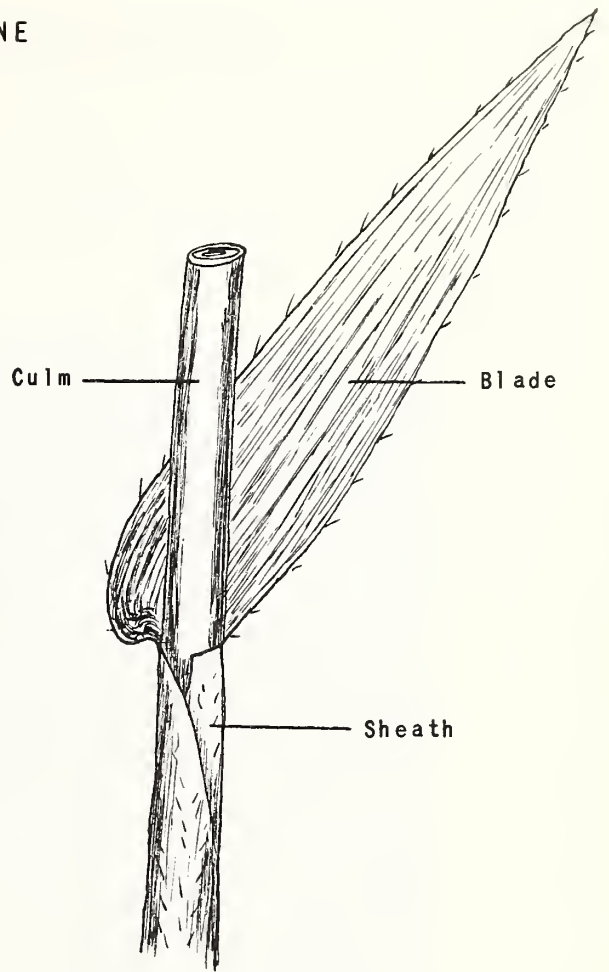
Growth Habits

Growth stages vary approximately one month from South to North Florida. Following a cold spell in November in South Florida, blue maidencane goes dormant until late December at which time new growth in the form of basal leaves emerges from rhizomes. By mid-March, growth height averages 5 inches and 14 inches by June 1. An inflorescence with sterile spikelets is formed during June. A mechanical soil disturbance where blue maidencane is present will produce a vigorous growth from the cultivated rhizomes. (Example: Newly plowed firebreaks) Subterranean spikelets are first evident during June on pedicles 1 - 2 inches long. By October, these spikelets are in a soft dough stage and mature by mid-November or early December. Forage yield determinations during June in South Florida indicate 2,500 - 3,000 pounds air dry forage per acre from pure stands under 35 - 40 percent canopy shade of slash pine. Thirty days later, 1,000 pounds of air dry forage were obtained from regrowth. Samples of soil one foot square, six inches deep and supporting a pure stand of vigorous blue maidencane were found to yield approximately 10,000 pounds of air dry rhizomes. These same soil samples produced 7 subterranean spikelets of the current season and 23 from previous seasons. Over one-third of the old spikelets were damaged by insects. New plants produced from these spikelets have not been observed.

Forage Value and Management

Blue maidencane is very palatable and furnishes grazing yearlong in South Florida. It is considered excellent fall grazing in northern parts of the state and will provide good roughage throughout the winter months. Excellent response is obtained by deferring ranges where blue maidencane is present. Due to its ability to produce a high yield in pure stands under crown canopy, blue maidencane is a valuable forage grass in a woodland grazing program. Blue maidencane is classified as an increaser on all sites where it occurs. As decreaser grasses become less in the composition on the flatwood sites, blue maidencane increases. Continued heavy grazing finally reduces the amount of blue maidencane present to only scattered plants.

BLUE MAIDENCANE



KNOTROOT BRISTLEGRASS

Identification

Knotroot bristlegrass (*Setaria geniculata*) is a warm season, whitish-green perennial. Stems come from short, knotty, branching rootstalks. Blades are flat, 1/4 inch wide, 8 - 10 inches long, pilose on the upper surface, conspicuous midrib. Sheaths rounded. Ligule a fringe of short hairs. Inflorescence yellowish, dense, spikelike, 1½ - 2 inches long, 1/2 - 3/4 inches in diameter. Spikelets crowded and subtended by 5 or more bristles. Base of plant slender and wiry.



Knotroot bristlegrass

F-731-9

Distribution and Site Adaptation

Knotroot bristlegrass is distributed throughout Florida on a wide range of soils. It occurs primarily on the slough site in south Florida and on the very wet flatwood sites in north Florida. Bristlegrass commonly occurs in the salt marshes and is a part of the stable plant community. The occurrence of knotroot bristlegrass on other sites is of minor importance.

Growth Habits

Major growth is made from March or April through September. Two and sometimes three seed crops are produced in a single growing season. The first inflorescences appear during late May or June. The short, knotty rhizomes do not materially contribute the spread of the grass. Observations indicate that seed may be consumed by wildlife or have poor viability and germination as seedlings and young plants are uncommon.

Forage Value and Management

Bristlegrass has fair grazing value, usually grazed by cattle during spring and summer months. It becomes unpalatable during the fall and provides poor roughage when compared to the better bluestems and paspalums. Knotroot bristlegrass does not occur in large enough amounts even on ranges in good condition to be the species upon which to base proper use and management. Knotroot bristlegrass is a decreaser on the slough site where it is associated with blue maidencane, bluejoint panicum, hairy and shortspike bluestems. It is an increaser in the salt marsh site.

CARPETGRASS

Identification

Three species of carpetgrass occur in Florida. Big carpetgrass, (*A. furcatus*); tropical carpetgrass, (*A. compressus*) and common carpetgrass, (*A. affinis*). All are warm season, stoloniferous, creeping perennials forming dense sods. Blades are usually flat or folded, ciliate on the margins, abruptly rounded or only slightly pointed. Big carpetgrass is much more robust with culms 16 - 40 inches tall, blades 1/4 to 1/2 inch wide and usually more hirsute than the other species. Ligules are minute membranes. Racemes 2 in big carpetgrass and 2 to 5, usually 3 in tropical and common carpetgrass. When near maturity a reddish or purplish ting on half the length of the blade is fairly common on big carpetgrass. The carpetgrasses are considered by some to be a native of Florida. Others are of the opinion that the grass was introduced from South America.



Two common species of carpetgrass

F-745-7

Distribution and Site Adaptation

The carpetgrasses occur throughout Florida on soils ranging from sands to mucks and peats. Big carpetgrass is found more commonly on the marsh site and other similar areas where organic matter content and moisture is fairly high. The carpetgrasses are not commonly found on the sand scrub or sandhill sites.

Growth Habits

In extreme Southern Florida, the carpetgrasses remain partially green during the winter season although growth is limited. In Central and Northern parts of the state, carpetgrass becomes dormant during November and December and remains so until April or May. Stolons and seed heads are produced continually during the active growth period. Spread is from both seed and stolons. The carpetgrasses form pure stands. Forage yields of mature carpetgrass on the flatwood site range from 1,000 - 1,800 pounds per acre, dry basis.

Forage Value and Management

Carpetgrass is an important forage plant in many localities and is considered good grazing during the summer months. Managed as a range grass, however, production is very low when compared to a climax community composed of creeping bluestem and Florida paspalum on the flat-woods or maidencane on a marsh site. Carpetgrass provides poor quality winter roughage. Where carpetgrass is the only grass available and must be depended upon, maximum results (with or without fertilizer) is obtained by grazing only half of the current season's growth. Due to their low growth form, the carpetgrasses are able to withstand close grazing. Under heavy grazing, carpetgrass usually replaces the tall and more productive bluestems, paspalums and panicums on nearly all sites. All three species are classified as invaders on all sites except on the Fresh marsh site where big carpetgrass is an increaser.

SALTMARSH CHLORIS

Identification

Saltmarsh chloris (*Chloris glauca*) is a striking grass with its extremely flattened sheaths and blades and dark green color. Culms are 3 - 4 feet tall, very erect, compressed at the base. Basal sheaths several, compressed, keeled and much overlapping. Blades 12 - 14 inches long, flattened, much rounded on the tip. Sheaths merge into the blade smoothly without a distinct collar. Ligule a minute fringe of hair. Inflorescence consists of 15 - 20 spikes, each 4 - 5 inches long. Spikelets brown, all on one side of the rachis. Saltmarsh chloris is a warm season, perennial bunchgrass.

Distribution and Site Adaptation

Saltmarsh chloris occurs in scattered areas throughout Florida where calcareous soils are present. It is a component part of the stable plant community on the sweet flatwoods site where it is associated with creeping bluestem, Florida paspalum, giant paspalum, lopsided Indiangrass and blue maidencane. Chloris also occurs in brackish marshes, from which came the common name. Its center of distribution in Florida appears to be in east central and southern portions of the state.

Growth Habits

Growth starts early in February in South Florida with portions of the plant remaining green through much of the cool season. Complete dormancy occurs in Central and North Florida. Seed is produced two or three times during the long growing season. Growing points are well above the ground and within easy reach of livestock.

Forage Value and Management

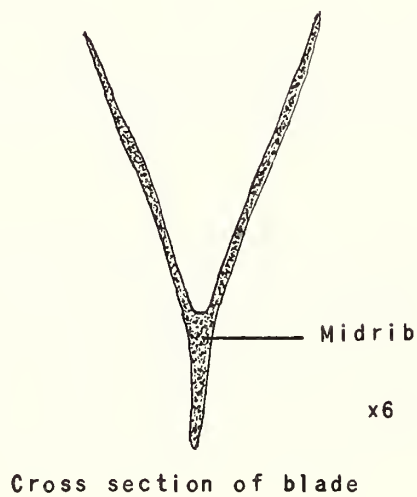
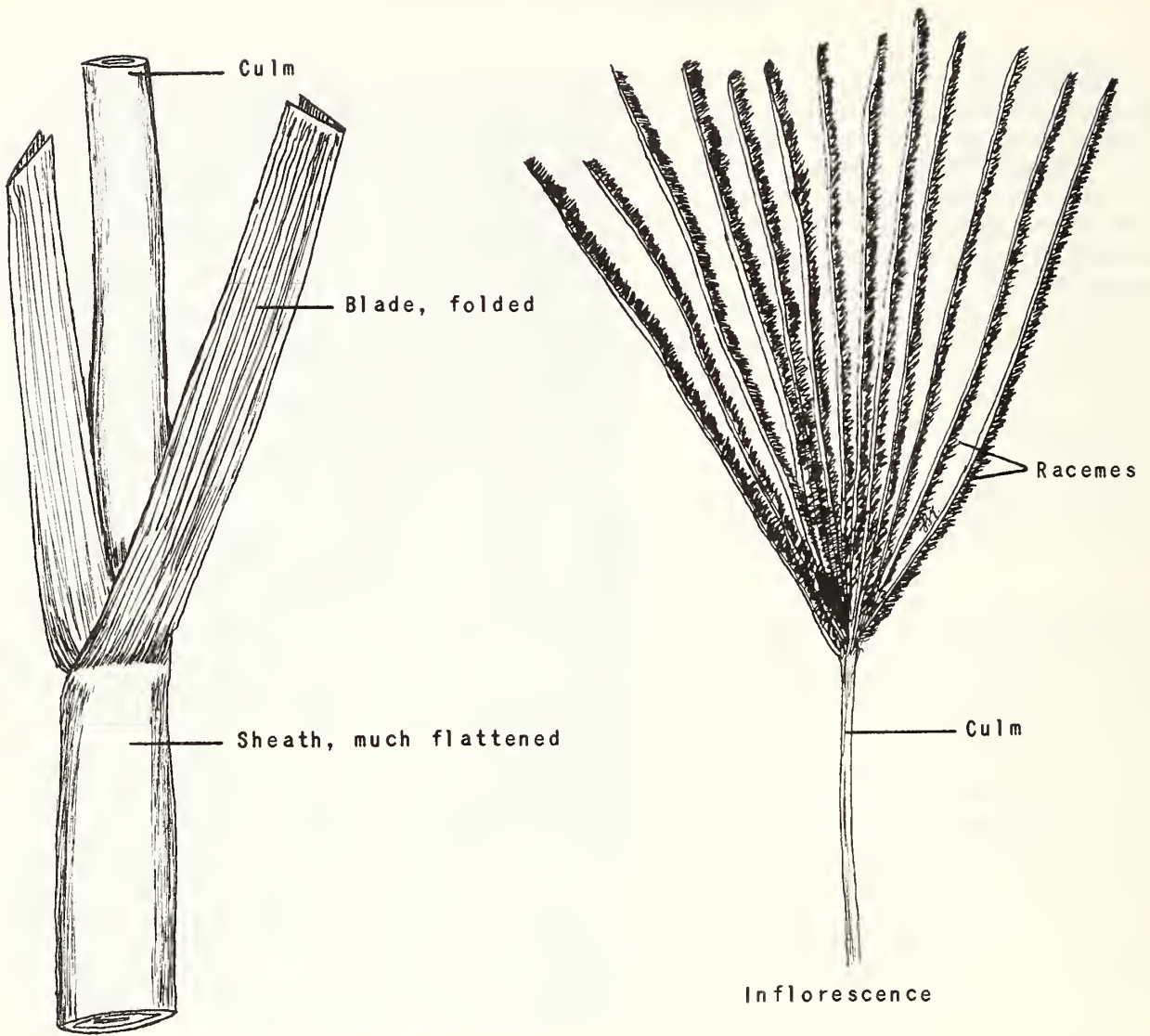
Saltmarsh chloris is a bunchgrass and extremely palatable. Careful management must be exercised to properly graze saltmarsh chloris due to its high palatability. Excellent winter grazing has been obtained in the Glades Soil Conservation District on a sandy soil, shallow to rock. Deferred grazing during the main growth period (February through July) is a requirement to increase the vigor and promote the spread of this grass. Graze no more than one half of the current season's growth, by weight, to maintain its vigor. Saltmarsh chloris is classified as a decreaser on the sweet flatwood sites and other sites where found.



Saltmarsh chloris

F-737-B

SALTMARSH CHLORIS



STIFFLEAF CHLORIS

Identification

Stiffleaf chloris (*Chloris petraea*) is a perennial, warm season, mainly a bunch grass, but producing distinct stolons or rooting from decumbent culms. Culms 1 to 3 feet tall, strongly compressed. Sheaths compressed and sharply keeled. Blades folded 4 to 8 inches long, numerous. Stolons slightly flattened. Inflorescence composed of 4 to 6 racemes each 2 to 3 inches long.

Distribution and Site Adaptation

Stiffleaf chloris is common throughout Florida on a wide range of soils. Occurs widely on disturbed areas, especially conspicuous on road shoulders. Rarely occurs on slough, fresh marsh and not very common on acid flatwoods. Especially adapted to soils underlain with marl, shell or limerock.

Growth Habits

Does not produce much growth until weather becomes real warm in April or May. Vegetative growth is rapid during the summer rainy season, producing several seed crops and stolons. Cool weather retards growth quickly and a long dormant period results. Root systems are shallow and individual plants are easily pulled from the soil.

Forage Value and Management

Stiffleaf chloris is not too commonly found on most native grazing lands in the lower condition classes, due to its fairly high palatability. For this reason, it is considered an increaser, especially on sites with marl or limestone subsoils. Natural production is low and insufficient volume is produced upon which to base management.



A vigorous plant of stiffleaf chloris. F-728-6
Plants are usually smaller.

BIG CORDGRASS

Identification

Big cordgrass, (*Spartina cynosuroides*) is the largest of the cordgrasses with culms 3 to 10 feet tall. The robust rhizomes form dense colonies. Blades are flat, 1/2 to 1 inch wide, very scabrous on the margins, often 18 to 24 inches long. Culms frequently as much as 3/4 inch thick at the base. Sheaths round. Inflorescences much larger than other cordgrasses, frequently 12 to 18 inches long, open with spikes up to 3 inches long. Spikelets often 1/2 inch long.



Big cordgrass

LA-62-044

Distribution and Site Adaptation

Big cordgrass is distributed primarily in the coastal marsh area of the Gulf coast of Florida extending from just north of Tampa to St. Marks Wildlife Refuge on the Apalachee Bay. It does not occur in any great abundance over a large area such as seashore saltgrass or the other cordgrasses of the saltmarsh. It is primarily adapted to the saltmarsh (mineral) site and in a stable plant community, associated with marsh-hay cordgrass.

Growth Habits

Major growth is from late March through September or October. Some green growth remains through the winter months at the base of the plant. It grows from robust rhizomes which form dense colonies. Large conspicuous seed heads are formed during the fall months. Big cordgrass occurs in areas often termed "slightly salty" or on the fresher side of "brackish". Salinity requirements vary from 0.5 to 2.0 percent and water levels between -4 and 2 inches.

Forage Value and Management

Good forage is produced in late winter and spring months. Nutritive values are included with those of other saltmarsh grasses in the writeup of marsh-hay cordgrass. Deferments during summer and fall months are natural due to insects in the salt marsh range. This favors and insures normal growth and development of big cordgrass and its associated species. During winter and spring months, 50 percent removal by weight, is proper use for big cordgrass. Big cordgrass is a decreaser on all sites where it occurs.

MARSHHAY CORDGRASS

Identification

Marshhay cordgrass, (*Spartina patens*), is a robust perennial with culms 2 to 3 feet tall. Blades are 12 to 14 inches long, 1/8 inch wide, extremely rough on the upper surface. Blades are semi-involute which gives a somewhat wiry appearance. Sheath rounded; ligule a ragged membrane 1/8 inch long. Extensively creeping rhizomes present. inflorescence a sparse panicle 2 to 6 inches long composed of 3 to 5 spikes with spikelets on one side of a continuous rachis. Spikes at nearly right angle to the culm.

Distribution and Site Adaptation

Marshhay cordgrass occurs primarily in the coastal marsh areas of the Gulf Coast of Florida, extending from just north of Tampa to St. Marks Wildlife Refuge on the Apalachee Bay. Within these boundaries it occupies the greatest area of the salt marsh community. Marshhay cordgrass also occurs in the Nassau SCD north of Jacksonville, Florida, and minor occurrence elsewhere along the coasts of Florida. Marshhay cordgrass is adapted primarily to the salt marsh (mineral) site.



Marshhay cordgrass

F-772-2

Associated species in a stable plant community include big cordgrass, seashore saltgrass, seashore paspalum and small amounts of smooth cordgrass. On areas where the salinity reaches the lower levels (0 to .5 percent) switchgrass, *Panicum virgatum*, commonly occurs with marshhay cordgrass.

Growth Habits

Major growth of marshhay cordgrass is obtained from April through June. Major spread is from the extensively creeping rhizomes. Seed is generally produced during September and October. The optimum fluctuating water level of marshhay cordgrass is -4 to +2 inches. Water salinity ranges from 0 to 2.5 percent. Pure stands frequently occur. Approximately 8,000 pounds of air dry forage per acre is available from marshhay cordgrass. This may vary as much as 20 to 30 percent over a period of years. Peak production or most rapid growth is obtained during April and May. A nutritive analysis of the dominant salt marsh grasses including marshhay cordgrass is given in the table on the following page.*

* Louisiana data.

<u>GRASS</u>	<u>GROWTH STAGE</u>	<u>CRUDE PROTEIN - %</u>	<u>P - %</u>	<u>Ca - %</u>
Marshhay cordgrass	young	12.74	.17	.17
	bloom	7.50	.10	.22
	mature	5.42	.10	.26
	dormant	-	-	-
Smooth cordgrass	young	11.09	.20	.35
	bloom	7.81	.17	.53
	mature	9.50	.17	.74
	dormant	-	-	-
Big cordgrass	young	12.33	.22	.18
	bloom	6.16	.15	.49
	mature	6.56	.12	.60
	dormant	5.19	.09	.27
Seashore saltgrass	young	8.39	.12	.25
	mature	6.75	.08	.25
	dormant	6.27	.08	.22

Forage Value and Management

Excessive and continuous grazing of these grasses results in the invasion of the less desirable plants, particularly black needlerush (*Juncus roemerianus*). When black needlerush is controlled by chemical or mechanical means, marshhay cordgrass quickly recovers and under good grazing management, will soon become established.

Marshhay cordgrass provides excellent grazing from October through March when supplements, mainly protein, are furnished. Grazing during this period and deferring through the main growth period will insure a continuous and high production from this grass. Marshhay cordgrass is classified as a decreaser on the saltmarsh (mineral) site.

Disturbing or altering the site by diking or ditching and thereby upsetting the natural balance of salinity and water levels, will seriously curtail production of marshhay cordgrass.

SAND CORDGRASS

Identification

Sand cordgrass (*Spartina bakeri*) is a warm season, robust bunchgrass. Mature plants often reach 18 - 20 inches basal diameter with seed stalks 3 - 5 feet tall. Blades are flat, 1/4 inch wide, light green on the upper surface and rough to the touch. Lower surface, dark green. Blades, involute when drying. Sheaths, rounded. Often called "switchgrass" by ranchers.

Distribution and Site Adaptation

Sand cordgrass occurs throughout Florida on the Sand pond and Fresh Marsh (Mineral) sites. As a component part of the potential plant community, sand cordgrass is associated with the following species:

<u>Site</u>	<u>Associated Grass Species</u>
Sand Pond	maidencane longleaf threeawn stiff paspalum andropogon spp.
Fresh Marsh (Mineral)	maidencane cutgrasses beaked panicum

Growth Habits

Major growth is made during the spring season, with seed being formed during late May and June in central and southern Florida. Regrowth continues through the summer months until fall. Some green growth remains in the basal portions of the plant during the cool winter months. Data on seed is unavailable but indications are that much viable seed is produced due to numerous young plants found on depleted ranges.

Forage Value and Management

Sand cordgrass is classified as an increaser on all sites where it occurs. Approximately 10 - 15 percent of the total herbage produced under climax conditions is produced by sand cordgrass. Cattle carefully select the more palatable maidencane and under continuous grazing pressure maidencane decreases with sand cordgrass and other undesirable species increasing. Sand ponds and fresh marsh (mineral) sites in poor and fair condition class are frequently dominated by cordgrass. Natural levels of water during summer months in the ponds and marsh



Sand cordgrass

F-479-9

sites control the grazing where sand cordgrass occurs. Drainage without the control of livestock on these sites permits excessive grazing. Excessive drainage of the sites permits sand cordgrass to spread even more rapidly.

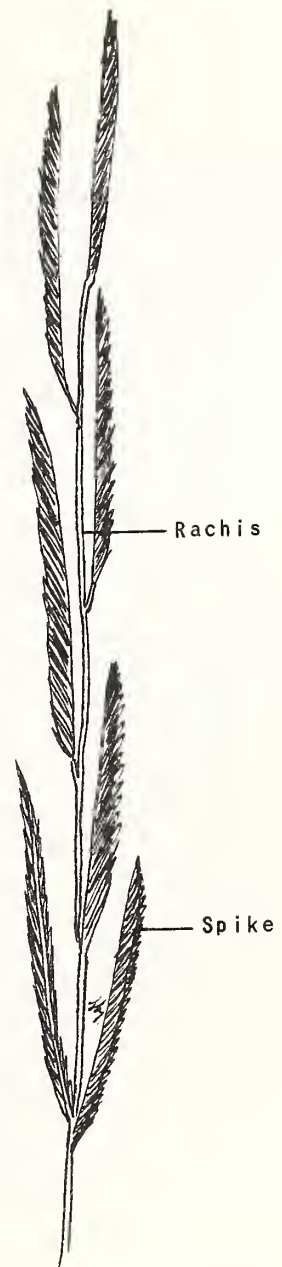
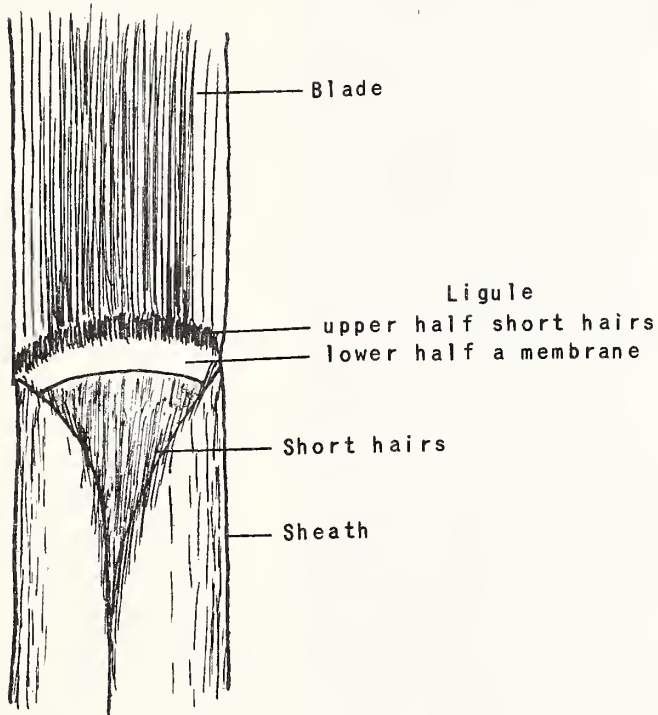
Sites occupied by sand cordgrass still contain adequate amounts of maidencane to provide the vegetative source (rhizomes) for range improvement. Within the large clumps of cordgrass, and out of reach by cattle, are found vigorous plants of maidencane. From these protected plants, fresh marsh ranges can be improved by deferred grazing during the peak growing period of maidencane (April through July). Stands of sand cordgrass burned in winter will provide fair quality grazing for a short period in the spring months, the remainder of the year it is tough and unpalatable. Sand cordgrass may be partially controlled by cutting with a heavy disk. Treated area must be given a full growing season deferment to permit maidencane and other grasses to regain vigor.



Fresh Marsh (Mineral) range site, dominated by sand cordgrass.

F-610-10

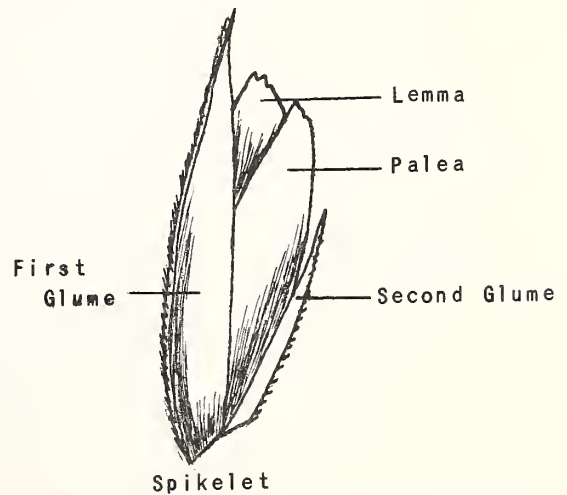
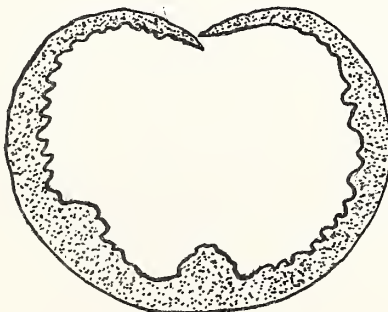
SAND CORDGRASS



X-Sections of Blade



Inflorescence a Panicle



SMOOTH CORDGRASS

Identification

Smooth cordgrass, (*Spartina alterniflora*), is a robust perennial with culms 3 to 4 feet tall. Culms are soft or spongy and 1/2 inch thick at the base. Blades are 3/4 to 1 inch wide, 12 to 20 inches long, flat and tapering to a point. Blades are conspicuously two-ranked and tightly rolled when dry. Sheaths rounded, closely overlapping. Collar purplish tinged. Extensively creeping scaly rhizomes. Ligule a minute ragged membrane. Inflorescence an open panicle 10 to 12 inches long, composed of 12 to 15 spikes. Spikes 2 to 3 inches long with spikelets on one side of a continuous rachis.

Distribution and Site Adaptation

Smooth cordgrass occurs primarily in the coastal marsh areas of the Gulf Coast of Florida, extending from just north of Tampa to St. Marks Wildlife Refuge on the Apalachee Bay. Sizeable areas of smooth cordgrass also occur in the Nassau SCD north of Jacksonville, Florida. Minor occurrence elsewhere. Smooth cordgrass is adapted primarily to the salt marsh (organic) and salt marsh (soft) sites of the coastal marsh where it forms

nearly pure stands. It also occurs extensively on the salt marsh (mineral) site where it is associated with marshhay cordgrass, big cordgrass and seashore saltgrass.

Growth Habits

New growth and spread is primarily from aggressive rhizomes. Due to the moderate climate of the salt marsh site, considerable green growth is present during winter months. Major growth is from April through September with seed head production during October and November. Smooth cordgrass is often found growing in pure sea water and forms dense stands on areas subject to daily tidal action. It prefers a water level that fluctuates from 0 to 12 inches above ground level. Salinity requirements are from 1.2 to 5.0 percent in the free soil water. Peak production is obtained during April, May, and June. Smooth cordgrass will produce an average of 7,580 pounds per acre dry weight. Yields of five tons have been reported.



Smooth cordgrass

F-770-11

Forage Value and Management

Excellent range forage is available from smooth cordgrass, particularly during the winter months. See table included in marshhay cordgrass for nutritive qualities of the saltmarsh grasses. Smooth cordgrass has been proven valuable as a wildlife food particularly for geese. Maximum yields from grazing are obtained during spring and early summer months when approximately 50 percent of the current production, by weight, is grazed. Deferment the remainder of the growing season permits growth that is valuable for winter grazing. Smooth cordgrass is a decreaser on all sites where it occurs. Continuous heavy grazing on any of the cordgrasses in the salt marsh ranges causes them to decrease. Smooth cordgrass is replaced primarily by black needlerush, *Juncus roemerianus*. Site alteration such as diking, ditching, or pumping seriously upsets the natural environment of salinity and water levels needed by smooth cordgrass. This usually results in elimination of the grass itself and replacement by undesirable plants.

CUTTHROAT GRASS

Identification

Cutthroat grass (*Panicum abscissum*) is a warm season perennial, frequently occurring in pure stands. Growth is from a robust tuft and spreads primarily from strong thick rhizomes. Mature blades are narrow, approximately 16 - 18 inches long, tapering and stiff. When dry, the blades become angular with long twists the entire length. Inflorescence is an open panicle 8 - 10 inches long, purple. Sheath is very wide and cuts back sharply to form the blade; both are sharply keeled. Ligule 1/32 inch long or less, a membrane.

Distribution and Site Adaptation

Cutthroat occurs primarily in the Highlands SCD and extreme southeastern Polk SCD. One isolated colony (less than one acre) was found in central Hendry county in 1962. Cutthroat is adapted to Leon and Rutlege soils on seepy slopes. As a part of the potential plant community



Cutthroat grass



Basal growth and rhizomes of cutthroat grass

F-739-6

F-544-5

cutthroat is associated with the following species:

<u>Site</u>	<u>Associated Grass Species</u>
Sandy seep	chalky bluestem
	Creeping bluestem
	broomsedge bluestem
	hairy panicum
	beaked panicum

Growth Habits

Growth begins in early January with grand growth period in March, April, May and sometimes early June. Seed stalks form in June with seed maturity by late July or early August. Regrowth occurs during September. Some growth during winter months is common, and low January temperatures of 20 - 25° F frequently fail to produce frost damage.

Herbage yields from pure stands indicate 800 pounds of air dry forage by April 1 and a maximum of 3,500 pounds by August 1. Random samples of mature forage collected in January showed an analysis of 5.0% crude protein, .51% K, .70% Ca, .63% Na, .04% P, and no trace of cobalt. Vigorous cutthroat grass will produce a rapid regrowth of 12 - 14 inches within 24 days during the main growth period. Good growth is obtained under as much as 35 - 40% crown canopy shade of a pine forest.

Forage Value and Management

Cutthroat grass is an increaser on the site where it occurs when the range is grazed with cattle during the summer months. Cutthroat grass is less palatable than the bluestems and other panicums. On ranges that have been habitually overgrazed during the summer months, these species die out and cutthroat grass increases and establishes itself in pure stands. With continued heavy grazing pressure, this grass is eventually replaced by pineland threeawn, carpetgrass, gallberry, fetterbush and annuals. Deferred grazing from early March through June provides the needed rest for cutthroat to become vigorous and increase in density. Cattle do well during winter months when grazing cutthroat grass if it is supplemented with protein. Burning is practiced by ranchers on South Florida rangelands more by custom than as a tool to manage grass. Considerable evidence in the field is available that fire is not needed in the management of the grass.

CURTISS DROPSEED

Identification

Curtiss dropseed (*Sporobolus curtissii*) is a perennial bunchgrass with culms 1 to 2 feet tall from dense tufts. Leaves are very fine, narrow, mostly basal. Individual plants are conspicuous among other grasses due to the light green color of the leaves. Blades are 6 to 10 inches long, flat, hairy on the upper surface, near the base. Basal sheaths pilose at the throat. Ligule minute or obscure. Inflorescence an open panicle 6 to 8 inches long. Glumes are straw colored and conspicuous and remain after the seed have matured and fallen.



Curtiss dropseed

F. 761-4

Distribution and Site Adaptation

Curtiss dropseed occurs throughout all of north and central Florida but rarely occurs south of Volusia, Marion, or Citrus counties. It is not known to be in South Florida. It is primarily adapted to the flatwoods site with some occurrence in the more moist aspects of the sandhill site. Curtiss dropseed is associated with such grasses as pineland threeawn, creeping bluestem, cutover muhly, hairy panicum, blue maidencane and silkyscale.

Growth Habits

Curtiss dropseed is one of the few native grasses that makes considerable growth during the winter months. Flowering stalks and seed are produced during early May and June. Vegetative growth remains fairly green during summer and early fall months. Only a few seed stalks are produced from a single plant.

Forage Value and Management

Only a small percentage, by weight, of the total composition of a stable plant community is produced by Curtiss dropseed. General observations indicate that it is an increaser on most sites where it occurs. On the Alapha Experimental Range near Tifton, Georgia, Curtiss dropseed made up 10 - 15 percent of the ground cover of the understory herbage in 1950.

Curtiss dropseed when present has fair forage value during winter and spring months. Usually associated with pineland threeawn, it is utilized at the same time when ranges are burned during winter and early spring months. At the Alapha Experimental Range, near Tifton, Georgia, Curtiss dropseed contributed 13 percent of the total forage intake during April. In December, it contributed as much as 25 to 37 percent. Forage analysis made during spring months indicates the nutrient levels were generally slightly above maintenance requirements but much below during the remainder of the year.

PINEWOODS DROPSEED

Identification

Pinewoods dropseed (*Sporobolus junceus*) is a cool season, perennial bunchgrass. Leaves primarily basal, very narrow, less than 1/16 inch wide, 8 - 15 inches long, tightly rolled and resemble thin pine needles, glabrous. Ligule minute or absent. Sheaths rounded, longer than internode. Culms 24 - 36 inches tall, purple on upper one-third. Inflorescence an open panicle, bronze or purple, 4 to 6 inches long with branches arranged in rather regular whorls.

Distribution and Site Adaptation

Pinewoods dropseed is distributed throughout Florida on a wide range of soils and sites. Pinewoods dropseed appears to be most abundant on wooded and reasonably well drained sites. It comprises a small part of the total plant community and is associated with the following sites and species:

<u>Site</u>	<u>Associated Grass Species</u>
Acid and Sweet	creeping bluestem chalky bluestem
Flatwoods	Indiangrass pineland threeawn low panicums Florida threeawn broomsedge bluestem toothachegrass
Sandhills and Sandhill phosphatic	Gulf bluestem Indiangrass pineland threeawn splitbeard bluestem creeping bluestem low panicums paspalums



Pinewoods dropseed

F-728-4

<u>Site</u>	<u>Associated Grass Species</u>
Loamy Upland	big bluestem Indiangrass Switchgrass pinehill and Elliott bluestem pineland threeawn broomsedge bluestem low panicums cutover muhly

Growth Habits

The grand growth period of pinewoods dropseed occurs during the late winter and spring months. Vegetative growth is generally completed by the time flowering stalks develop in late April and May. It appears to grow better in well shaded areas and where competition from other grasses is relatively light.

Forage Value and Management

On all sites where it occurs, pinewoods dropseed reacts to grazing pressure as an increaser. Rarely occurs in large percentage by weight or in pure stands.

Observations in central Louisiana indicate that pinewoods dropseed made up only 1 percent of the ground cover and provided only 3 - 5 percent of the yearlong cattle diet. Pinewoods dropseed is not an important forage species and it is very unlikely that it will ever be a species upon which to base a management program.

LOPSIDED INDIANGRASS

Identification

Lopsided Indiangrass (*Sorghastrum secundum*) is known as "wildoats" by many ranchers. A warm season perennial bunchgrass readily recognized in September and October by the golden brown panicle with seed appearing on one side. Seed stalks 3 - 6 feet tall. Base of culms felty-pubescent. Ligule a membrane 1/4 - 1/2 inch long, pointed. Blades flat 1/4 - 1/2 inch wide, 12 - 24 inches long. Sheaths rounded. Another species, *Sorghastrum nutans*, with long rhizomes, occurs very infrequently.

Distribution and Site Adaptation

Lopsided Indiangrass is distributed throughout Florida, Southern Alabama, Georgia and South Carolina. In Florida, it is a part of the total plant community on the following sites:



Lopsided Indiangrass

F-544-10

<u>Sites</u>	<u>Associated Grass Species</u>	<u>Sites</u>	<u>Associated Grass Species</u>
Acid Flatwoods and Sweet Flatwoods	creeping bluestem toothachegrass chalky bluestem pineland threeawn Curtiss dropseed switchgrass Florida paspalum broomsedge bluestem Florida threeawn	Sandhills	pineland threeawn splitbeard bluestem switchgrass Gulf bluestem
		Loamy Upland	big bluestem switchgrass slender bluestem

Growth Habits

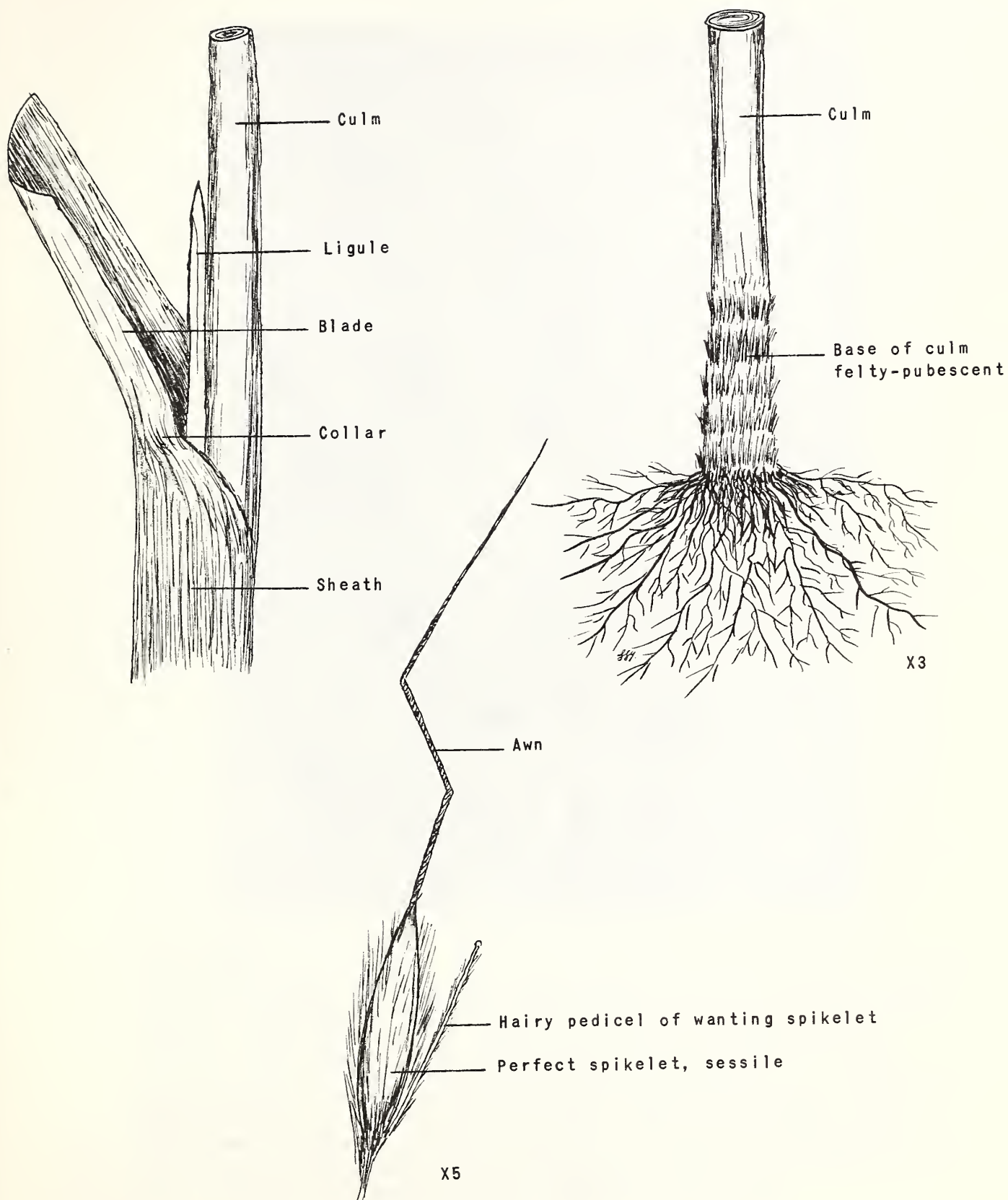
In South Florida, growth commences by mid-January and by mid-March or early April in Northern Florida. Major leaf growth is obtained in April, May and June. During July or August, major growth is in the formation of a boot and seed stalk. Seed heads appear in September with seed maturing during October. Very little if any new leaves or basal growth occurs after booting stage.

Forage Value and Management

Lopsided Indiangrass is classified as a decreaser on all sites where it occurs. It is first of the decreaser grasses to lose vigor and decrease in the plant community as the result of grazing pressure. On flatwood sites in poor condition, Indiangrass occurs within areas protected from grazing such as saw palmetto. These areas furnish the needed seed source for increasing Indiangrass on flatwood sites.

On flatwood sites in good condition, lopsided Indiangrass will contribute as much as 15 percent of the total understory herbage yield. To improve the composition of poor and fair condition ranges where Indiangrass is a part, complete growing season deferments are needed. The occurrence of the conspicuous seed heads is a good indicator that no grazing has taken place on the area during the previous summer months. Maturity of lopsided Indiangrass seed is likewise an indicator that other desirable native grasses of the flatwood site have completed their growth cycle.

LOPSIDED INDIANGRASS



Paired spikelets

LOVEGRASSES



Elliott lovegrass

F. 455-12

Identification

Three or four perennial lovegrasses (*Eragrostis* spp.) occur on native grazing lands of Florida which furnish small amounts of forage at various times of the year. The most important of these are: Coastal lovegrass (*E. refracta*); Elliott lovegrass (*E. eliotii*); purple lovegrass (*E. spectabilis*) and the introduced Thalia lovegrass (*E. chariis*). All of these are perennial and generally warm season bunch grasses. Purple lovegrass occasionally produces rhizomes. Blades are flat, slightly pilose on the upper surface, 8 - 20 inches long and frequently whitish on the upper surface. Sheaths round and pilose at the throat. Ligules are usually minute, absent or a ring of fine hair. Inflorescence a spreading panicle 18 - 24 inches long and nearly as broad. The purple inflorescence of purple lovegrass is outstanding.

Distribution and Site Adaptation

The more common native lovegrasses are widely distributed throughout Florida and occur on nearly all sites. They often occur on sandhill and loamy upland sites where they are associated with Indian-grass, big bluestem and paspalums. The introduced *Thalia* lovegrass occurs widely in South and Central Florida and appears to thrive on disturbed areas.

Growth Habits

This group of lovegrasses are warm season perennials and begin growth during April and May. The main growth period is usually complete by July and August with the formation of seed. Generally very little, if any, new growth is made after September.

Forage Value and Management

The lovegrasses are classified as increasers on all sites where they occur. As a minor part of a stable plant community, the lovegrasses produce approximately 5 percent of the total herbage yield. Continuous grazing pressure will eventually eliminate the lovegrasses from a site.

Thalia lovegrass is very palatable and field observations indicate it is grazed throughout the year. The other lovegrasses are fair grazing value. It is doubtful that at any time the lovegrasses would be a key grass on which to base management.



Thalia lovegrass

F-742-2

MAIDENCANE

Identification

Maidencane (*Panicum hemitomon*) is a perennial, warm season, characteristically lush green, and grows two to six feet tall from creeping rhizomes. Blades 8 to 12 inches long, one-half inch wide. Rhizomes produce both sterile and fertile shoots. Sheaths on sterile shoots frequently densely hirsute; sheaths on fertile shoots usually without hairs. Rhizomes thick, 1/8 to 1/4 inch in diameter. Inflorescence a compact, elongated panicle, 6 to 8 inches long.



Maidencane

L-134-3

Distribution and Site Adaptation

Maidencane is distributed throughout Florida on a wide variety of soils varying from mineral to peat. Maidencane is a good indicator of fresh marsh conditions where salinity is no problem in land use and development. The major site and species relationships are:

<u>Site</u>	<u>Associated Grass Species</u>	<u>Site</u>	<u>Associated Grass Species</u>
Fresh Marsh (mineral)	cutgrass giant cutgrass beaked panicum sand cordgrass	Sand pond	longleaf threeawn sand cordgrass cutgrasses
Fresh marsh (organic)	giant cutgrass	Swamp	beaked panicum hairy panicum barnyard grass



Fresh marsh (mineral) site, excellent condition class

F-674-1

Growth Habits

New shoots from rhizomes emerge during January in south Florida and during March in northern parts of the state. Study plots in the Highlands SCD indicate 5 inches of growth by February 19; 8 inches by March 16; 12 inches by April 9 and 18 inches by May 1. Generally seed heads are formed during June and July. Growth slows down on all sites during August and September when water levels become high. A second growth period occurs during October and November and frequently during early December in southern Florida. Maidencane is susceptible to cold and dies back readily immediately following freezing temperatures. Based on plot clippings in September, a pure stand of maidencane will yield 8,000 pounds air dry forage per acre on the fresh marsh (mineral) site. Very little is known on seed production, germination or viability.

Forage Value and Management

Maidencane is a climax decreaser on fresh marshes and sand ponds and in the narrow outer margins of swamps and "cypress stands". Relatively few species of grasses of great importance are represented in the stages of plant succession where maidencane is the climax decreaser. Sand cordgrass acts as a strong increaser and rapidly replaces maidencane on mineral soils on the fresh marsh site. Broadleaf carpetgrass, an invader, will completely dominate former maidencane ranges when ranges are habitually overgrazed,

Analysis of maidencane forage from ranges in Louisiana during the first 6 months:

<u>Month</u>	<u>Stage</u>	<u>N</u>	<u>Crude Protein</u>	<u>Ca</u>	<u>P</u>	<u>K</u>
January	Young	2.29	13.31	.26	.26	2.26
February	Young	2.82	17.63	.10	.22	1.78
March	Young	2.71	16.94	.23	.12	1.40
April	Young	2.83	17.69	.19	.12	1.58
May	Seedstalk	3.26	20.38	.21	.25	1.38
June	Bloom	2.60	16.25	.19	1.60	1.12
September	Mature	--	9.81	.24	.19	--

Maidencane is choice grazing throughout the year in southern Florida. Excellent grazing is available in central and north Florida from early spring until late fall. Normally, maidencane obtains a natural deferment through summer months during the normal period of high water. Periodic deferments from grazing are needed during spring and fall months to maintain good stands of maidencane. Marsh sites in poor condition class must be given full growing season deferments to improve one or more condition classes.

CUTOVER MUHLY

Identification

Cutover muhly (*Muhlenbergia expansa*) is a large tufted perennial bunchgrass. The culms are 1 to 3 feet tall, slender and often lax. Blades are 12 to 14 inches long, wiry and tough with the margins folded or rolled inward; very narrow and slightly twisted. Sheaths rounded with a pronounced white papery ligule 1/8 to 1/4 inch long, pointed. Old basal sheaths weather into a curly fibrous mass at base. Inflorescence is an open, fine, delicate panicle 14 to 20 inches long, purple. Spikelets scattered, 1/4 inch long, awnless or with a very short awn.

Distribution and Site Adaptation

In Florida, cutover muhly is distributed primarily in north and western part of the state. It occurs rarely south of a line from Levy County east to Volusia County. It is best adapted to the flatwoods site. As a part of a stable plant community in the understory composition, cutover muhly is associated with hairy panicum. Florida three-awn, creeping bluestem, blue maidencane, Curtiss dropseed and pineland threeawn.

Growth Habits

Cutover muhly makes its major growth during the period April through September. Usually there is a mixture of young, mature and dead growth in a single clump. Very little, if any, growth is made during the cool season, however, previous season's summer growth remains green. Seed stalks are produced in late August and September and frequently persist through the winter and early spring months.

Forage Value and Management

Observations in Louisiana indicate that cutover muhly is easily killed by fire due to the accumulation of dried basal sheaths which burn very hot. Over a ten-year period, annual fires in southern Mississippi killed cutover muhly on areas where grazing had been excluded. Cutover muhly usually makes up a small part of the total composition of the understory of the flatwood site where fire and grazing have been practiced. Cutover muhly reacts to grazing as a decreaser on sites where it occurs. New growth of cutover muhly is good forage. Old growth which remains green during winter months furnishes fair forage when protein

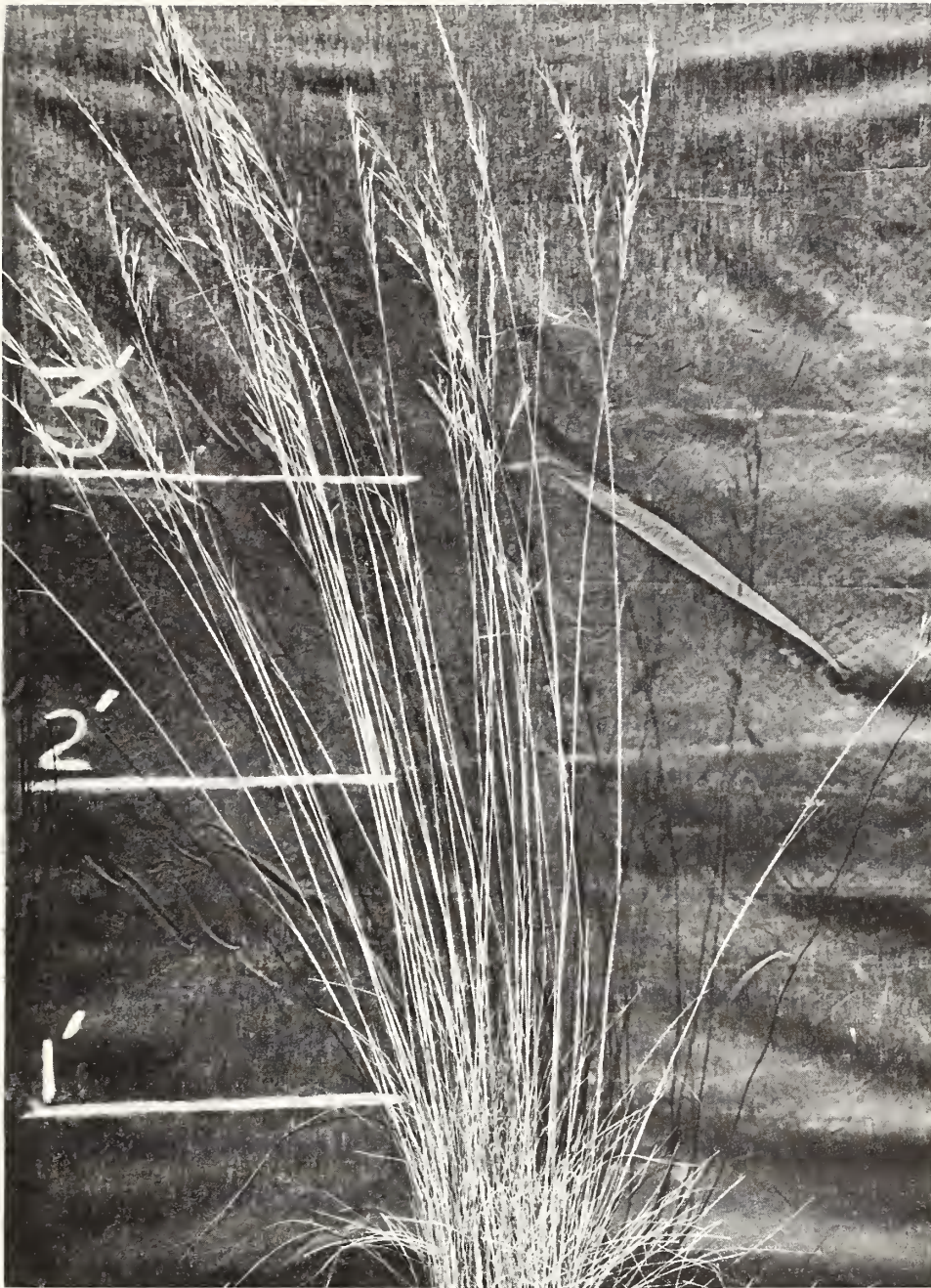


Cutover muhly

F-755-12

supplements are furnished. Foliage samples taken in January in Louisiana indicated a 2.8 percent protein content. Limited controlled burning and proper use will encourage cutover mulch to contribute more to the total available forage in the understory of the flatwood site.

BLACKSEED NEEDLEGRASS



Blackseed needlegrass

F-711-11

Identification

Blackseed needlegrass (*Stipa avenacea*) is a cool season, perennial bunchgrass. Basal leaves 6 - 12 inches long, extremely fine and nearly hair-like; 1/16 inch wide, tightly rolled when drying. Ligule a membrane 1/16 - 1/8 inch long, rounded at the tip, transparent. Sheaths longer than internodes, rounded on the back. Upper blades 2 - 4 inches long, very fine, smaller than sheaths. Culms 3 - 4 feet tall, inflorescence an open panicle 6 - 8 inches long. Glumes light-colored, papery and remain after seed has matured and fallen. Lemmas black, adhering to the seed; awn twisted, 2 - 2 1/2 inches long. Normal plants 4 - 6 inches in basal diameter. Mature culms very pale and conspicuous.

Distribution and Site Adaptation

Blackseed needlegrass is distributed throughout Florida and occurs primarily on the following site where it is a part of the total plant community:

<u>Site</u>	<u>Associated Grass Species</u>
Sandhill	Indiangrass splitbeard bluestem Gulf bluestem hairy panicum pineland threeawn creeping bluestem

Growth Habits

Blackseed needlegrass is primarily a cool season grass, making its major growth from November to late April. Seed stalks form during late April with seed maturity in May. Very little growth occurs during summer months.

Forage Value and Management

Comparison of relict areas with grazed areas in the sandhill site indicates blackseed needlegrass to be a decreaser. During the cool season when green forage is generally unavailable, cattle readily select this grass and as a result it has decreased materially from the amount present in a potential plant community.

Figures are not available on forage production of blackseed needlegrass. Deferred grazing from early fall until seed maturity in May will renew plant vigor, and encourage the spread of this grass. The use of fire during early spring months severely interrupts the normal growth and development of needlegrass.

BEAKED PANICUMS

Identification

Several species of beaked panicums belong to this group and these have a close resemblance. These are beaked panicum, *P. anceps*; redtop panicum, *P. agrostoides*; Combs panicum, *P. combsii*; purple panicum, *P. stipitatum*; *P. condensum* and longleaf panicum, *P. longifolium*. Cutthroat grass and hairy panicum belong to this group but are described separately. As a group the beaked panicums are warm season, tufted perennials with culms 2 to 4 feet tall, compressed at the base. Sheaths are keeled, frequently purplish tinged and with soft hairs. Blades are folded at the base and half V-shaped towards the tip, 1/2 inch wide. Leaves are stiffly erect which gives the individual plant a distinct, upright appearance. Inflorescence usually 6 to 14 inches long. Spikelets usually 1/8 to rarely 1/4 inch long.

Distribution and Site Adaptation

As a group, at least one of the beaked panicums may be found in every Soil Conservation District in Florida. All are particularly adapted to areas subject to long periods of wetness. The beaked panicums are an important part of the potential plant communities in marshes, swamps and on seepy slopes sites.



Panicum condensum, no common name.

F-748-1



Redtop panicum

F-748-2

Associated grass species are maiden-cane, blue maidencane, Florida joint-tail and barnyardgrass.

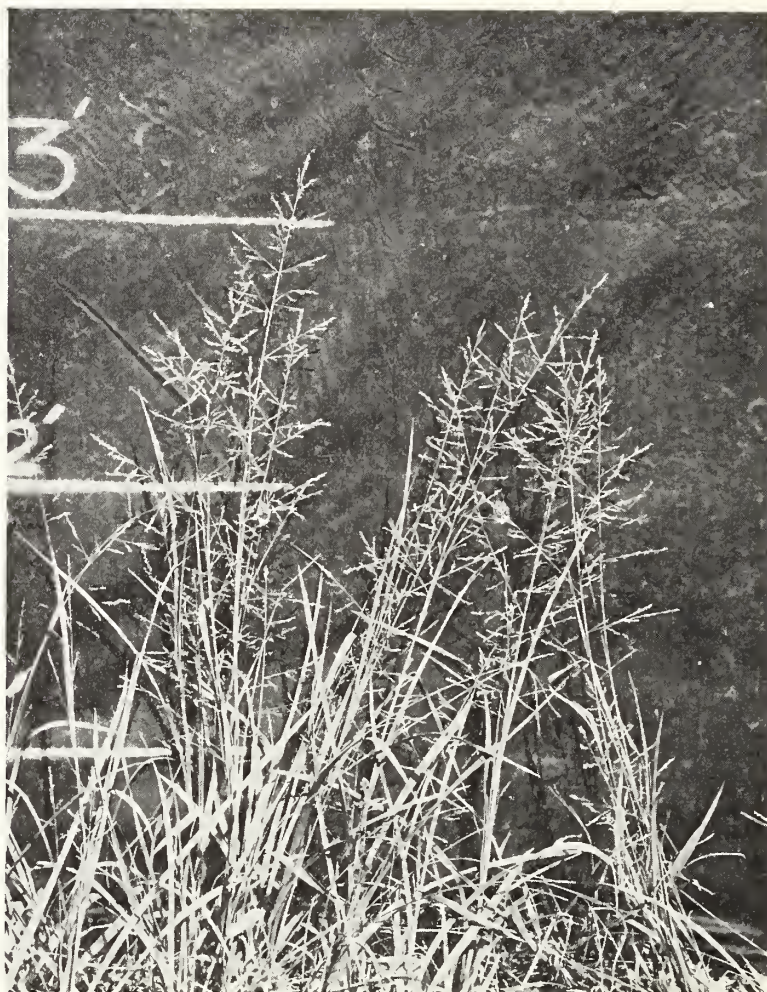
Growth Habits

The beaked panicums start growth during February in south and central Florida. Major vegetative growth is completed by late July and August. Seed heads appear during September. The beaked panicums appear to be very tolerant of shade, especially in the margins of forested swamps. Pure stands are common. All species produce abundant seed, however, little or no data is available relative to germination or viability.

Forage Value and Management

The beaked panicums are decreasers on the sites where they occur. Ungrazed or relict areas show a large percentage of the composition to be made up of these species of panicums. Heavy and continuous grazing on these sites reduces the amount of beaked panicums present and these are replaced by low panicums, broomsedge bluestem, annual weeds and grasses. The principle woody invader on these sites is waxmyrtle.

Forage value is generally good during the spring and summer months. Cattle select these panicums at this time of the year and during winter months the roughage is fair. A protein supplement should be fed with it. Normally these sites receive adequate deferments when improved pastures are managed for grazing during summer months.



Beaked panicum

F-755-4

HAIRY PANICUM

Identification

Hairy panicum (*Panicum rhizomatum*) is a warm season perennial grass forming thick clumps and sods from short scaly rhizomes. Culms 2 - 3 feet tall, grooved on one side. Blades flat, 1/4 to 1/2 inch wide, 12 to 18 inches long, villous on both upper and lower surfaces. Sheaths rounded, as long as the internodes, very villous, light tinge of purple on lower sheaths. Dense tuft of hair at junction of sheath and blade. Inflorescence 4 to 5 inches long, 2 inches wide, open. Spikelets set at an angle on the pedicel. Rhizomes numerous, short, scaly and white. Entire plant has a soft hairy aspect.



Hairy panicum

F-742-1



Row of hairy panicum
in Plant Materials Center,
Arcadia, Florida. One
season's growth.

F-742-4

Distribution and Site Adaptation

Hairy panicum occurs throughout Florida and extends into all of the southeastern states. In Florida, it is best adapted to the following sites where it is a part of a potential plant community:

<u>Site</u>	<u>Associated Grass Species</u>
Acid and Sweet Flatwoods	creeping bluestem lopsided Indiangrass chalky bluestem blue maidencane pineland threeawn Florida threeawn switchgrass
Sandhills	creeping bluestem Indiangrass Gulf bluestem splitbeard bluestem

Growth Habits

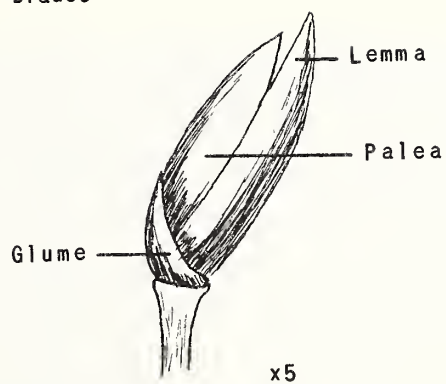
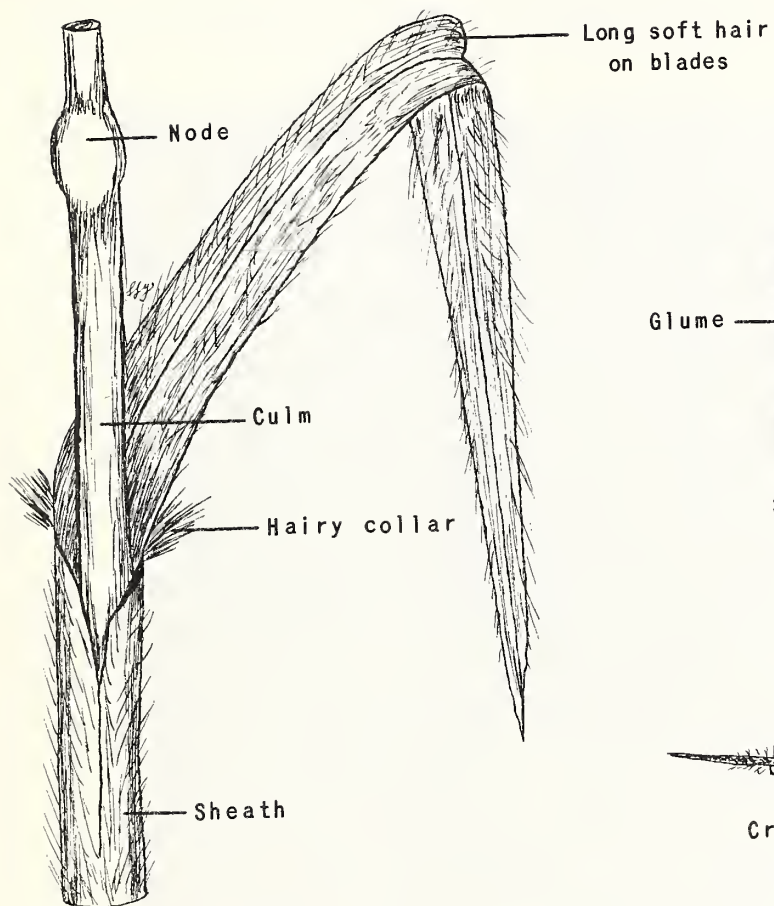
Hairy panicum produces an upright growth from large clumps or colonies. Major spread is from rhizomes, although an abundant seed crop is produced each year from vigorous plants. Spring growth starts from old rootstocks and rhizomes in January in south Florida. New growth is about 30 to 45 days later in north-east Florida. Major vegetative growth is completed by late August at Arcadia. This grass will not remain green following low temperatures of 25 - 30 degrees as compared to the cold hardiness of creeping bluestem.

Seed heads develop during early September with seed maturity in October. Individual plants low in vigor frequently produce only a single shoot and blade from a rhizome. On severely grazed ranges such a plant may go unnoticed among the carpetgrasses and low paspalums.

Forage Value and Management

Hairy panicum is classified as a decreaser on all sites where it occurs. On poor condition ranges it is found only in protected areas such as brush piles and palmetto clumps. Observation of relict areas and ranges in good condition indicates it to be nearly as abundant as creeping bluestem. Forage value is considered good. Hairy panicum is selected by cattle from early spring until late fall but is only fair roughage during winter months. Like all other decreaser grasses on poor and fair condition ranges, best results for improving vigor and density are obtained by deferred grazing. Deferments are most successful during the main growth period.

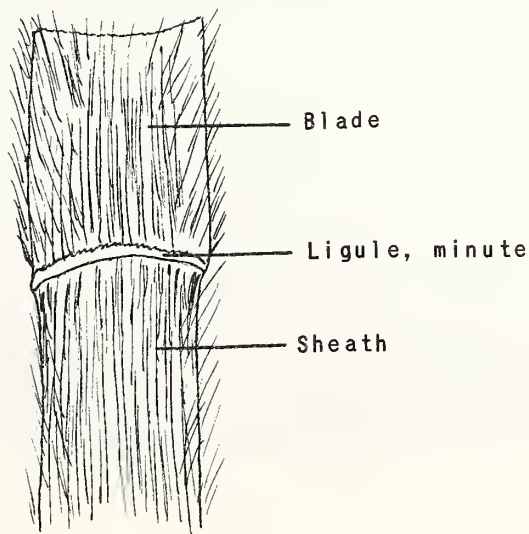
HAIRY PANICUM



Spikelet



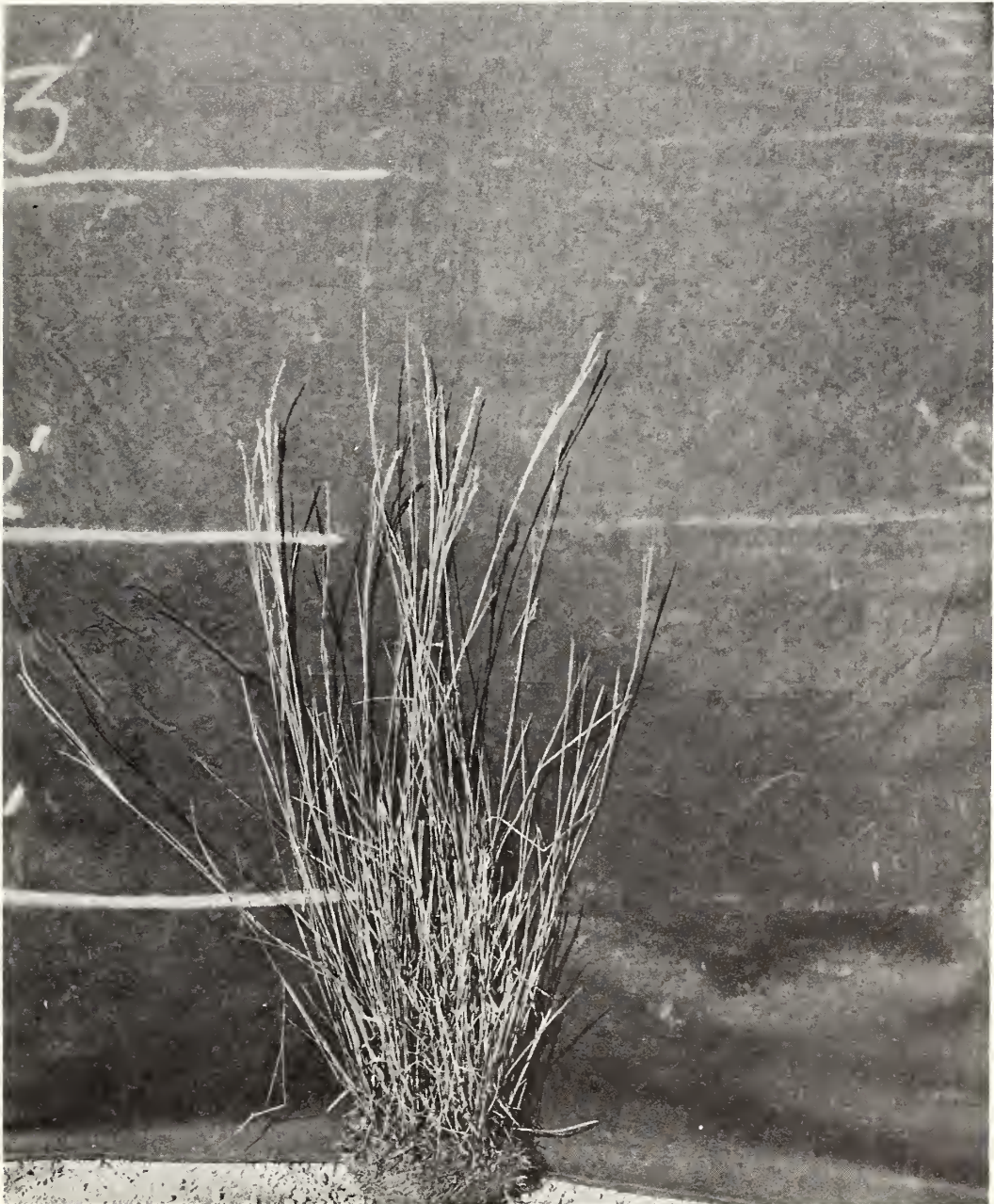
Cross section of blade



BLUEJOINT PANICUM

Identification

Bluejoint panicum (*Panicum tenerum*) is a warm season perennial bunchgrass with a very knotted, tough crown. Culms erect and wiry 1 1/2 to 2 feet tall. Inflorescence thin, spike-like panicle, 2 - 3 inches long. Spikelet subtended by 4 - 6 fine hairs which remain after seed is mature. Blades 4 - 5 inches long, 1/8 to 1/4 inch wide, flat, becoming involute when dry. Foliage dark green. Sheaths open rounded on the back, purplish and long pubescent towards the summit. Nodes smooth and distinctly blue to reddish. Ligule a fringed membrane, minute. Entire plant appears wiry.



Bluejoint panicum

F-737-9

Distribution and Site Adaptation

Bluejoint panicum is distributed throughout Florida and occurs on the following sites as a part of the total plant community:

<u>Sites</u>	<u>Associated Grass Species</u>
Slough	hairy bluestem blue maidencane chalky bluestem Florida threeawn shortspike bluestem
Acid Flatwoods	creeping bluestem pineland threeawn chalky bluestem low panicum broomsedge bluestem lopsided Indiangrass
Sand Ponds (Margins)	maidencane broomsedge bluestem chalky bluestem blue maidencane tall threeawn

Throughout the rockland areas of the Big Cypress Swamp and Everglades region bluejoint panicum is associated with species of panicums and bluestems.

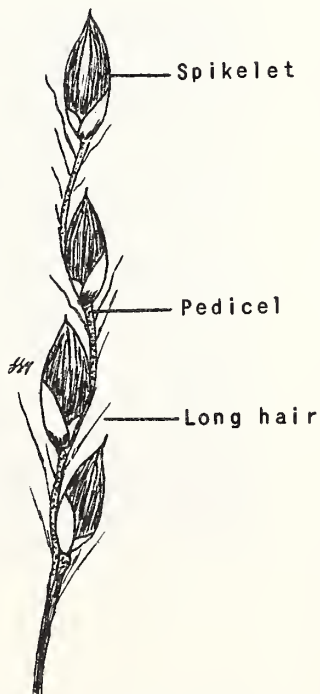
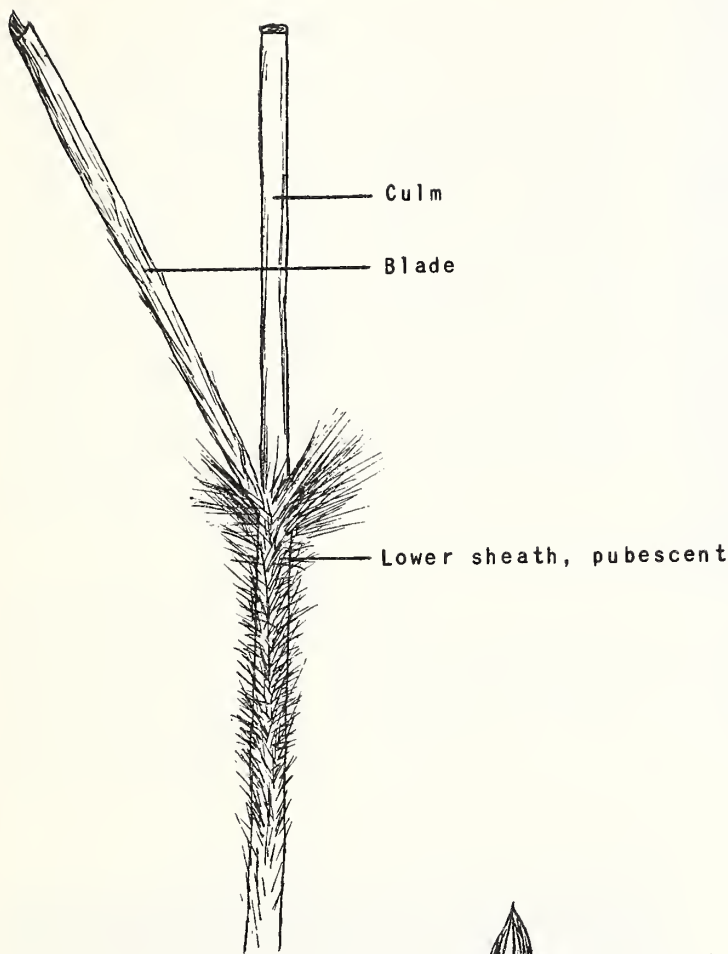
Growth Habits

Bluejoint panicum forms dense, robust bunches from a very tough crown. Main growth period occurs from February and March through July and August. Flowering stalks and seed are produced for a long period extending from late June through August. Very few seed are generally produced.

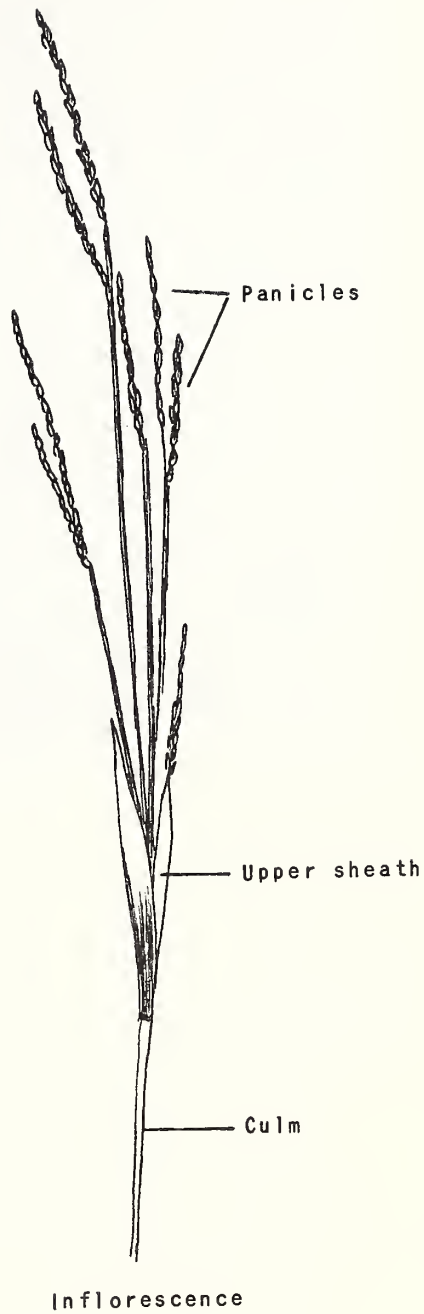
Forage Value and Management

Little is known relative to its reaction to various intensities of grazing pressure. It is presently classified as an increaser on the sites where it occurs. Over a two-year period on the Caloosa Experimental Range, Ft. Myers, Florida, bluejoint panicum only contributed one or two percent by weight of the total composition on the acid flatwoods site, poor condition. On slough sites in good condition, bluejoint panicum will contribute as much as 30 - 35 percent by weight, of the total herbage. In these cases, management and proper use would be based on bluejoint panicum.

BLUEJOINT PANICUM



Panicle X4 91



LOW PANICUMS

Identification

Low panicums (*Panicum spp.*) is the name given to a special group of panicums. Approximately 50 - 60 species of these panicums occur in Florida. These are so named because of a generally low growth form, usually less than 18 inches. Low panicums are perennial and have three distinct growth forms: winter rosettes, spring growth with seed stalks (vernal phase), and summer growth with seed stalks (autumnal phase). Seed heads on spring growth are usually open panicles; fall seed heads are smaller and with fewer spikelets. Blades are generally 1/4 inch wide or more on most of the low panicums. Sheaths and blades are frequently pilose.

Distribution and Site Adaptation

Low panicums are distributed throughout Florida and occur on all sites with possible exception of the fresh and salt marshes. As a small part of the total plant community, low panicums are important on the following sites:



F.711-8

Typical growth form of a low panicum



F.631-8

Two species of low panicums showing
a cushion-like growth

<u>Site</u>	<u>Associated Grass Species</u>
Acid and Sweet Flatwoods	creeping bluestem chalky bluestem pineland threeawn Florida threeawn Curtiss dropseed lopsided Indiangrass blue maidencane Florida paspalum
Hammocks	broadleaf uniola spike uniola purpletop

<u>Site</u>	<u>Associated Grass Species</u>
Sandhills	pineland threeawn creeping bluestem pineland dropseed Indiangrasses Lovegrasses spp.
Slough	shortspike bluestem hairy bluestem knotroot bristlegrass toothachegrass blue maidencane pineland threeawn
Sandy seeps (Highlands and Polk SWCD's)	cutthroat grass creeping bluestem chalky bluestem beaked panicum

Growth Habits

As indicated under identification, two or three growth forms are characteristic of the low panicums. Because of this, green growth is generally present yearlong. Low panicums stand considerable shade from associated taller grasses as well as forest canopies. Spring growth is upright with practically no branching. Autumnal growth is lower but much branched, often forming a dense, low cushion-like cover. Winter rosettes are likewise low and form a dense cushion.

Forage Value and Management

Low panicums are classified as increasers on all sites where they occur. As the taller grasses are grazed out, the low panicums increase but rarely become the major vegetation upon which to base management. High quality forage is produced by low panicums; however, the total amount is low compared to the production of the taller grasses that are climax for the site. Winter rosettes furnish some green forage during the winter months for cattle. Low panicums are excellent winter forage for deer.

BROWNSEED PASPALUM

Identification

Brownseed paspalum (*paspalum plicatulum*) is a warm season, dense green or glaucous tufted perennial with short rootstalks. Blades are slightly folded, stiff, bluish-green, 8 - 20 inches long, smooth. Sheaths compressed, rather papery, usually smooth, slightly purplish; culms compressed, often purplish at the base, 2 to 4 feet tall. Ligule a brown membrane, 1/8 inch long. Inflorescence of 3 - 7 racemes, each 2 1/2 to 3 inches long. Seed dark brown when mature. Spikelet extremely cross-wrinkled on the flat side.

Distribution and Site Adaptation

Brownseed paspalum occurs throughout the southeastern states. In Florida, it grows best in the flatwood regions in the north and central part of the state. Brownseed paspalum is locally adapted to all of the flatwoods sites and wet areas adjacent to borders of woods and swamps. As a part of the potential plant community brownseed paspalum is associated primarily with the Indiangrasses, creeping bluestem, chalky bluestem, beaked panicums, Florida paspalum, and switchgrass on the flatwood sites.

Growth Habits

New shoots emerge during January and February in central and south Florida. The new growth is usually conspicuously intermingled with last season's growth. First seed stalks are produced early in the summer with a few being produced continually until cold weather. Mature seed heads are mixed with green leaves and new seed stalks. The leaves retain their green color through much of the winter.

Forage Value and Management

Brownseed paspalum is classified as a decreaser on all sites where it occurs. On ranges in poor and fair condition class, seed sources of brownseed paspalum can usually be found in protected areas such as palmetto clumps, fence rows, under felled trees and in ungrazed areas.

Brownseed paspalum is very palatable and is grazed from early spring till fall. It is also one of the palatable species on winter ranges because the basal leaves remain green. A strong management program using deferred grazing during summer months will encourage the growth of brownseed paspalum.



Brownseed paspalum

F-731-5

GULFDUNE PASPALUM

Identification

Gulfdune paspalum (*Paspalum monostachyum*) is a warm season perennial, forming dense colonies from large, thick sharp pointed rhizomes. Dark brown scales cover the rhizomes. Culms are 3 to 4 feet tall. Blades are stiffly erect, 16 - 28 inches long, thick or slightly flattened at the base becoming round throughout. Blades are often longer than the racemes. Sheaths rounded, tightly clasping the culm. Summit of sheath with brown ear-like lobes. Ligule 1/16 inch long, difficult to see. Racemes 1 or 2, rarely 3, 4 to 8 inches long.

Distribution and Site Adaptation

Gulfdune paspalum occurs only in southern Florida, south of Sarasota, DeSoto, Glades, and Martin counties. Center of distribution appears to be in Hendry, Collier, and western Broward counties. It is particularly adapted to the soils that tend to show a neutral reaction due to the influence of limerock, marl or clay substratums. On the sweet flatwood site Gulfdune paspalum is an important species of a potential understory plant community and is associated with south Florida bluestem, creeping bluestem, switchgrass and many other paspalums.

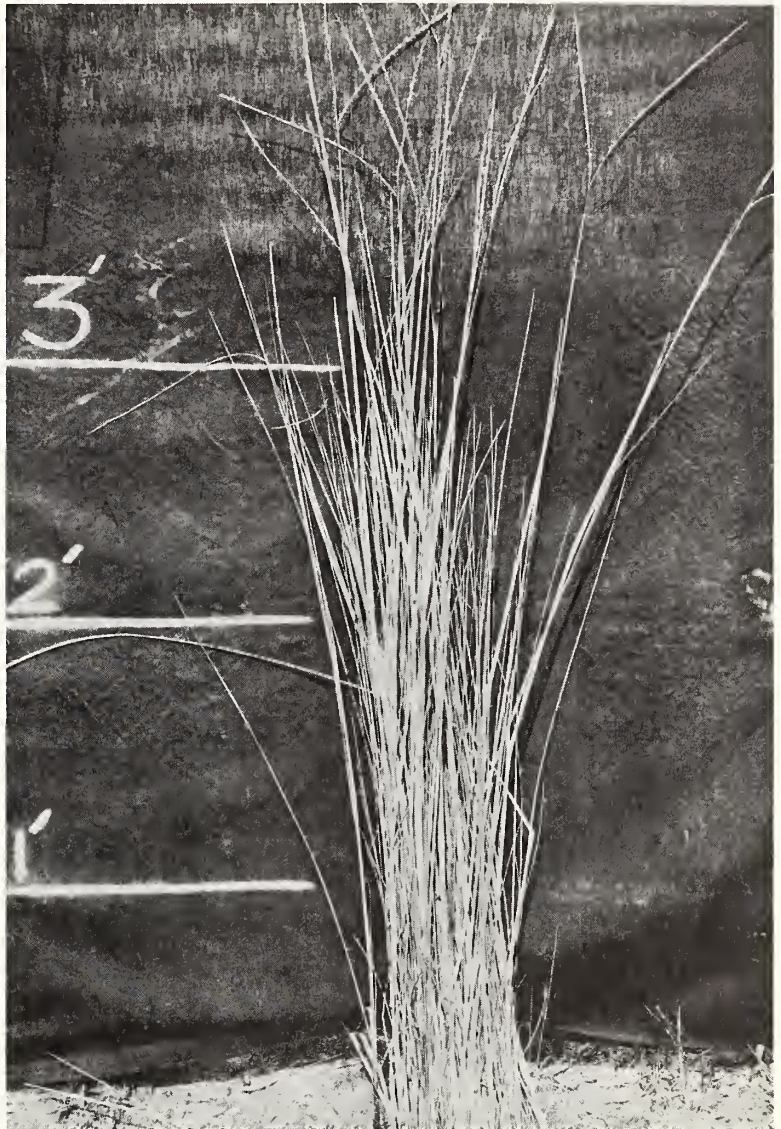
Growth Habits

Due to extremely long growing season in south Florida, Gulfdune paspalum produces forage from March through September. Dormancy period is short and occurs primarily in December and January. New shoots are produced from rhizomes nearly yearlong. Grand growth period is from late February through September. Seed are produced during September. Major spread appears to come from rhizomes. No data is available on the quality of seed. Based on plot clippings as much as 10,000 - 12,000 pounds of green forage per acre is available from pure stands.

Forage Value and Management

Observations on ranches in the Hendry SCD in south Florida, indicate Gulfdune paspalum to be a decreaser. Relict areas, ungrazed for several years, indicate that it is an important species making up an estimated 20 - 30 percent of a potential plant community.

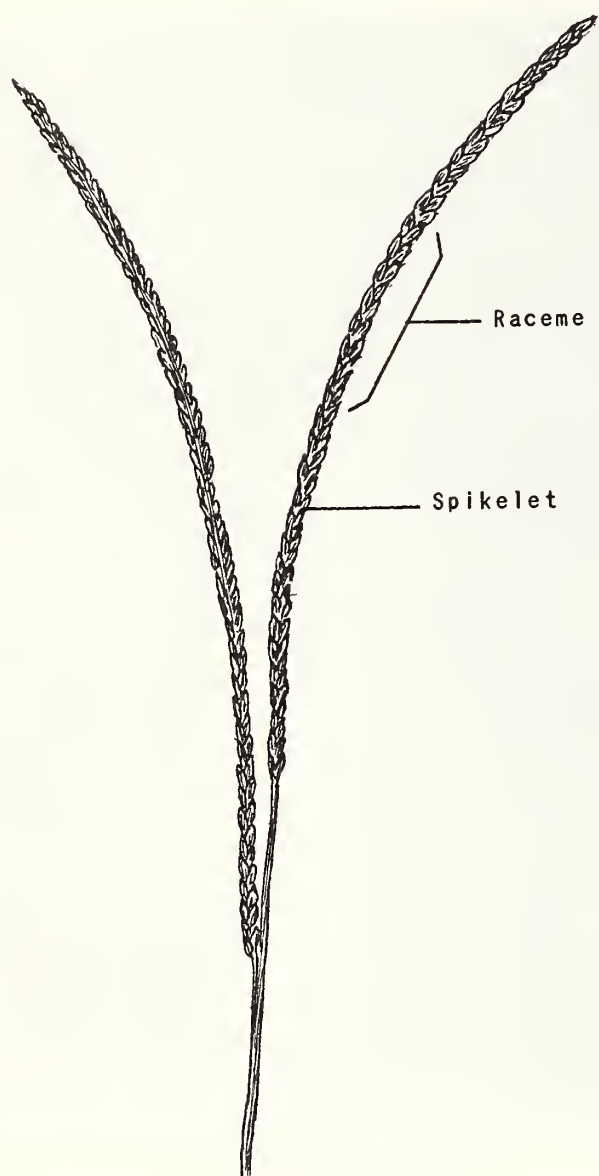
Cattle readily select Gulfdune paspalum throughout the growing season. A system of controlled grazing with emphasis on deferred grazing from March through September will encourage the growth of this paspalum. Any form of brush control where Gulfdune paspalum occurs must be followed by complete deferments.



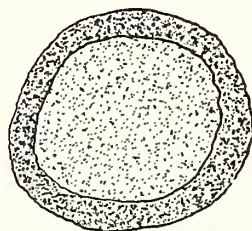
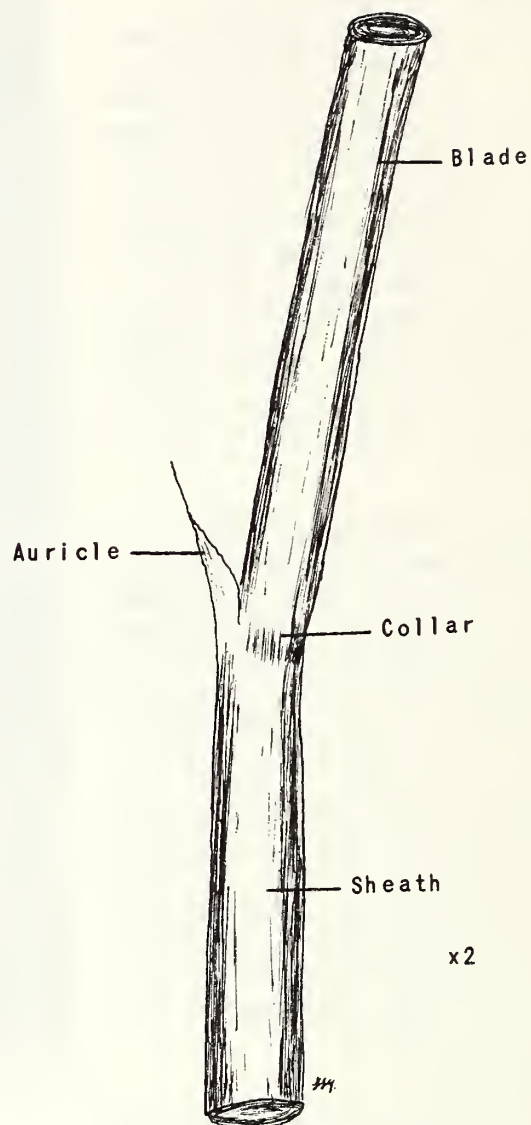
Gulfdune paspalum

F-748-7

GULFDUNE PASPALUM

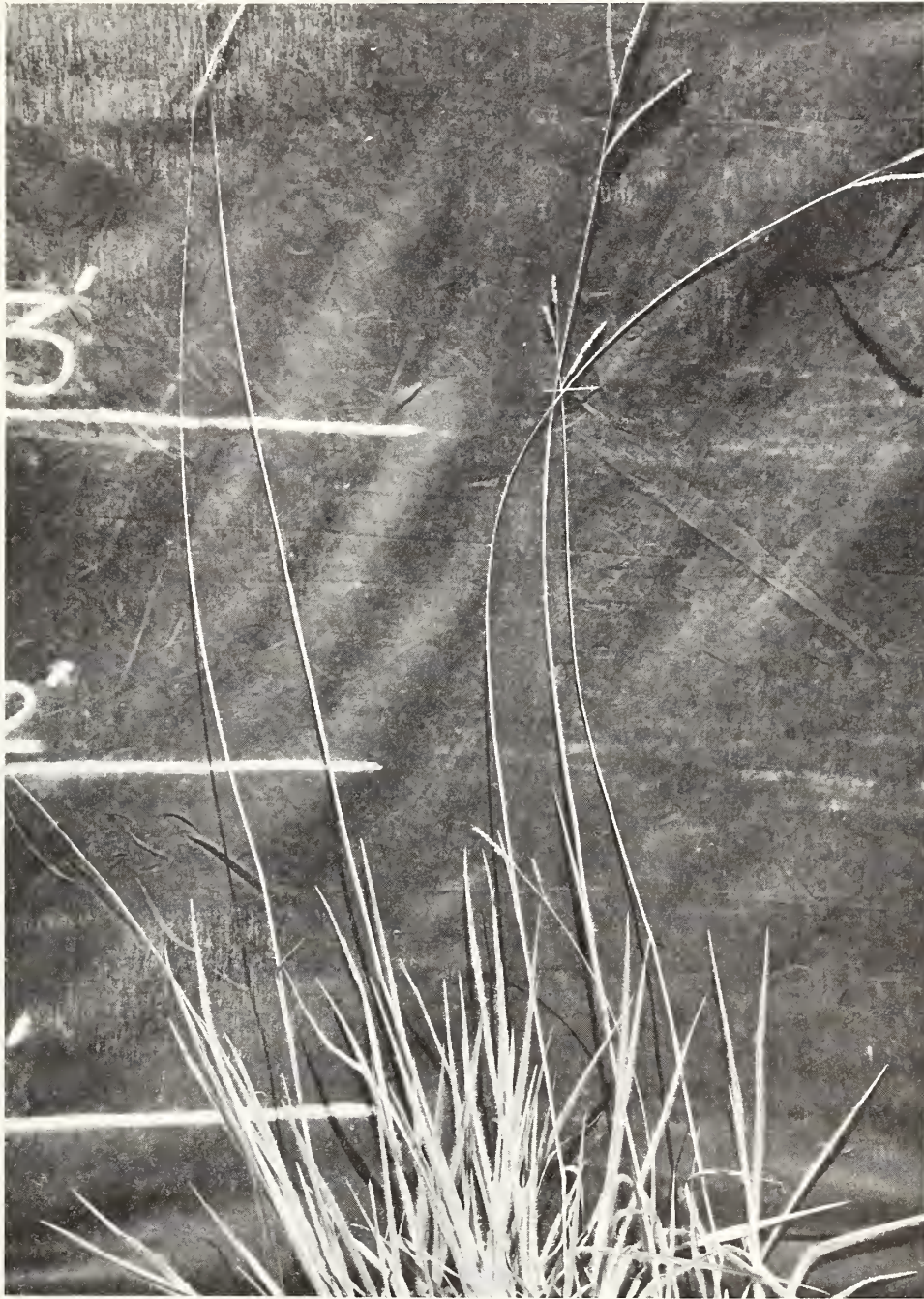


Inflorescence



Cross section of blade
x10

FLORIDA PASPALUM



Florida paspalum

F-731-6

Identification

Florida paspalum (*paspalum floridanum*) is a warm season perennial, robust grass growing in large clumps from large, pointed scaly rhizomes. Blades are flat 1/4 to 1/2 inch wide, 14 to 20 inches long, tapering to a point, frequently covered with long hair. Sheaths seldom cover the nodes, open, round, frequently covered with long hair. Culms 3 to 4 feet tall, erect. Ligule is a ragged, membrane 1/8 inch long. Racemes 2 or 3; stiff, 3 to 4 inches long. Spikelets 3/16 inch long. A more robust, hairless form occurs.

Distribution and Site Adaptation

Florida paspalum is distributed throughout Florida but less common south of Ft. Myers. recognized as a part of the total plant community, Florida paspalum occurs on the following sites:

<u>Site</u>	<u>Associated Grass Species</u>
Acid and Sweet Flatwoods	creeping bluestem Florida threeawn chalky bluestem pineland threeawn cabinis bluestem blue maidencane lopsided Indiangrass switchgrass
Loamy Upland	switchgrass big bluestem Indiangrass

Growth Habits

In central Florida, new shoots of Florida paspalum are produced in February and March. Flower stalks are developed during late July and are frequently mature by late August. Growth of rhizomes begins in late December and January prior to new spring growth.

Forage Value and Management

Florida paspalum is extremely palatable and readily selected by cattle during the entire growing season. Excessive grazing has reduced the vigor and total amount present on flatwood sites in poor and fair condition. Florida paspalum is considered a decreaser on all sites where it occurs.

Excellent forage is produced by Florida paspalum from early spring until mid-fall. Due to its succulence, rapid deterioration occurs following maturity which results in low volume for winter roughage. Periods of complete deferment during the grand growth period from April through August will encourage the growth of Florida paspalum and associated desirable species.

LOW PASPALUMS

Identification

Normally eight species of paspalum are classified into this group. These are:

barestem paspalum - *P. longepedunculatum*
thin paspalum - *P. setaceum*
goldhair paspalum - *P. debile*
longhair paspalum - *P. supinum*
hurrahgrass - *P. pubescens*
fringeleaf paspalum - *P. ciliatifolium*
littleseed paspalum - *P. propinquum*
stiff paspalum - *P. rigidifolium*



Three species of low paspalums

F-745-8



Longleaf paspalum

F-731-4

All are warm season perennials growing from a knotted base or very short rhizomes. Culms 1 1/2 to 2 1/2 feet tall, compressed at the base. Blades mostly flat 4 to 14 inches long and 1/2 inch wide, frequently with hairs on the margin. Sheaths often pilose or hirsute. Inflorescence of 1 to few (3) racemes, each 2 to 5 inches long. One raceme terminal at the end of a long peduncle; the auxiliary racemes sometimes hidden in the sheaths. The species are closely related and frequently intergrade. All appear to be low, leafy grasses often mistaken for one of the carpetgrasses.

Distribution and Site Adaptation

Low paspalums are profusely distributed in Florida and extend throughout the southeastern states. This group of paspalums is adapted to a wide range of soils and occurs on all of the range and woodland forage sites, with the possible exception of the salt marshes. Associated species are numerous.

Growth Habits

As a group, the low paspalums begin growth in March and April and produce vegetatively until cool weather in November. Seed are produced continuously through the summer and fall. Major reproduction is from seed, although a few species may spread from short weak rhizomes. Low paspalums are completely dormant during winter months except in extreme south Florida.

Forage Value and Management

Most of the low paspalums are fair forage during the spring and summer. Value as winter roughage is poor. Production is low compared to creeping bluestem or maidencane. Observations indicate that the low paspalums contribute more forage than the low panicums. Many flatwood ranges thought to be carpetgrass are actually composed of a large percentage of low paspalums. Proper range use in either case will be based upon 50 percent use of current season's growth by weight during the summer months. Deferred grazing on flatwood sites from spring until late fall will encourage the tall and more desirable grasses to replace the low paspalums.

PURPLETOP

Identification

Purpletop (*Tridens flavus*) is a warm season, perennial bunchgrass with culms 3 to 5 feet tall. Blades are flat, often 1/2 inch wide, 10 - 28 inches long, very smooth and a glossy green color. Basal sheaths overlapping, flattened and keeled. Sheaths have a short hairy collar. Inflorescence an open panicle 8 to 14 inches long, spreading, pyramid shaped, usually purple and sometimes nearly black. Branchlets drooping, covered with a very distinctive oily or grease-like substance. Normal plants are 6 to 8 inches in diameter at the base.

Distribution and Site Adaptation

Purpletop is distributed throughout Florida. In south and central Florida, it is adapted to fertile soils of the hammock and bottomland sites where it is associated with longleaf uniola, beaked panicums, low panicums and low paspalums. In north and west Florida, purpletop occurs primarily on the loamy-upland site and associated with big bluestem, Indiangrass and switchgrass.

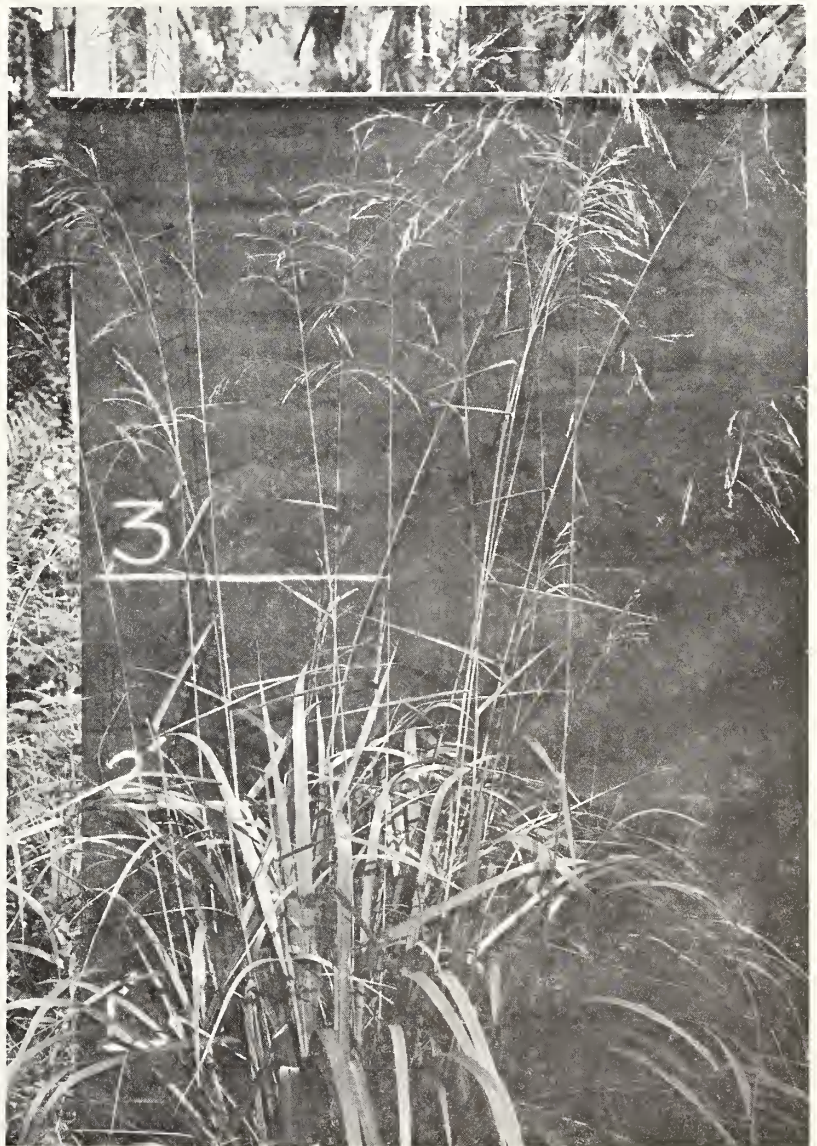
Growth Habits

New shoots appear early in the spring and continue growing until July. During August and September fruiting culms are produced with seed maturity during October. Blades are long and lax which become pronounced under medium and dense crown canopies.

Forage Value and Management

Purpletop is a decreaser on the hammock and bottomland sites and other sites where it occurs. Growing points are elevated within easy reach of grazing animals. On heavily grazed ranges, purpletop loses vigor and decreases rapidly.

The forage value of purpletop is best under open or sparse canopies. Grazing value as well as production decreases rapidly under medium and dense canopies. Very few hammocks are large enough and conveniently situated to permit individual management. However, if surrounding native grazing land is properly managed, purpletop and associated species will likewise respond.



Purpletop

F-748-12

SEASHORE SALTGRASS

Identification

Seashore saltgrass, (*Distichlis spicata*) is a low, perennial grass with extensive rhizomes and occasional stolons. Culms are stiff, 6 to 18 inches tall. Blades are numerous, 2 to 4 inches long, conspicuously two-ranked. Pure stands somewhat resemble bermuda grass. Blades are sharp pointed, involute when dry. Ligule, a minute membrane or absent. Sheaths rounded, closely overlapping. Inflorescence a dense spike, 1 to 2 inches long. Female flowers are produced on one plant and male flowers on another plant and these are usually difficult to distinguish.

Distribution and Site Adaptation

Seashore saltgrass occurs primarily in the coastal marsh areas of the Gulf Coast of Florida, extending north of Tampa to the St. Marks Wildlife Refuge on the Apalachee Bay. Minor amounts occur in the Nassau SCD and elsewhere along portions of the coastal areas. Seashore saltgrass is adapted to the saltmarsh (mineral) site of the coastal marsh. On this site it is a part of the potential plant community and associated with marshhay cordgrass, big cordgrass and to a minor extent, smooth cordgrass. Switchgrass, *Panicum virgatum*, is often associated with seashore saltgrass when the salinity level reaches the lower levels of 0 to .5 percent.



Seashore saltgrass

F. 772-7



New shoots of seashore saltgrass produced from rhizomes

F. 556-2

Growth Habits

Major spread is from rhizomes and to some extent from stolons. Seed production is heavy but germination and viability are unknown. Leaf growth remains green throughout most of the winter months. Main growth period extends from late March through September. Seeds are produced several times during the growing season. Seashore saltgrass tolerates a salinity range of soil water between 0.5 to 5.0 percent and with water levels averaging 6 inches below ground level to 2 inches above. Dense colonies or pure stands are characteristic and very common.

Forage Value and Management

Seashore saltgrass is a decreaser on the salt marsh (mineral) site where it primarily occurs. Continuous heavy grazing weakens saltgrass and permits the major invader, black needlerush to come in and dominate the site. Chemical or mechanical control measures applied to black needlerush, followed by grazing management, will permit seashore saltgrass to re-establish. Approximately 3,000 to 4,000 pounds of air dry forage is available annually. Yearlong grazing is generally available from seashore saltgrass but due to insects and heat during summer months, grazing is usually restricted. Excellent forage is available during the period from October through April or May. Deferment during the summer and early fall months is ideal for the maintenance of seashore saltgrass. See table included with marshhay cordgrass for nutritive analysis. Like all other grasses of the saltmarsh sites, seashore saltgrass is vulnerable to any disturbance of the site which would include the alteration of natural salinity or water levels. Maximum production is maintained only when 50 percent of the current production, by weight, is removed through grazing.

SWITCHGRASS

Identification

Switchgrass (*Panicum virgatum*), perennial, usually 3 to 6 feet in height, forming dense bunches or colonies. Stems come largely from scaly rhizomes. Stems are tough, hard and hollow. Sheath is free of hair. Ligule a dense ring of hair 1/8 inch long. Leaf blades are flat, up to 30 inches long and 1/2 inch wide. Seed head is an open panicle up to 10 inches long.

Distribution and Site Adaptation

Switchgrass occurs throughout Florida and is a component part of the total plant community on the following:

<u>Site</u>	<u>Associated Grass Species</u>
Sweet and Acid	creeping bluestem
Flatwoods	Indiangrass
	chalky bluestem
	Florida threeawn
	pineland threeawn
	Florida paspalum
Loamy Upland	big bluestem
	Indiangrass
	slender bluestem
	pinebarren tridens
Salt marsh (mineral)	smooth cordgrass
	marshhay cordgrass
	tall cordgrass



Switchgrass

F-633-12

Growth Habits

The major volume of growth on switchgrass occurs during the period March through September in south Florida

and approximately 40 days less in northern Florida. Very active rhizome growth occurs during January, February, March, and April. Switchgrass has withstood low temperatures of 25 - 30°F at Arcadia without apparent frost damage. Seed heads form during late August and September. Approximately four and one-half tons of air dry forage per acre have been produced at the Arcadia Plant Material Center from pure stands with fertilizer. Pure stands managed for seed will yield 100 - 150 pounds per acre, however, the number of pure live seed per pound is extremely low.

Forage Value and Management

Switchgrass is classified as a decreaser on all sites where it occurs. Continued grazing pressure reduces the vigor of individual plants with eventual loss of plants and forage production. On overgrazed ranges, switchgrass may be found within the protection of saw palmetto and other woody plants. From this vegetative source, switchgrass can be increased by range

management practices. Switchgrass produces excellent forage as a part of the total composition of flatwood ranges in good or excellent condition class.

Switchgrass is very palatable during spring, summer and early fall months. Deferred grazing during these months will permit switchgrass to regain vigor and spread by both rhizomes and seed. Many varieties of switchgrass have been observed in Florida. Two varieties designated Wabasso and Arstu, have been grown in the plant material center and show promise for forage production and rust free.

SILKYSCALE

Identification

Two species of silkyscale occur in Florida: purple silkyscale (*Anthaenantia rufa*) and green silkyscale (*A. villosa*). Both are perennial, warm season species with short rhizomes that form open colonies. Leaves chiefly basal but often erect, light green. Blades 1/4 to 1/2 inch wide, flat, soft, 6 to 12 inches long with blunt or tapering points. Blade margins with distinct fringe of hair. Sheaths rounded, crowded at the base, collar obscure. Ligule, a ridge-like membrane with dense ring of short hair. Culms usually single, 2 to 3 feet tall with dense narrow panicles 6 to 8 inches long, purple or green. Spikelets nearly round, densely villous.

Distribution and Site Adaptation

Both species of silkyscale are distributed throughout north and west Florida. Only minor occurrence below Citrus, Lake and Seminole counties. Purple and green silkyscale are adapted to the drier aspects of the flatwoods site and the sandhill site. The silkyscales are associated with a wide range of grasses common to a potential plant community on these sites. More important among these are creeping bluestem, hairy panicum, lopsided Indiangrass, broom-sedge bluestem and pineland threeawn.

Growth Habits

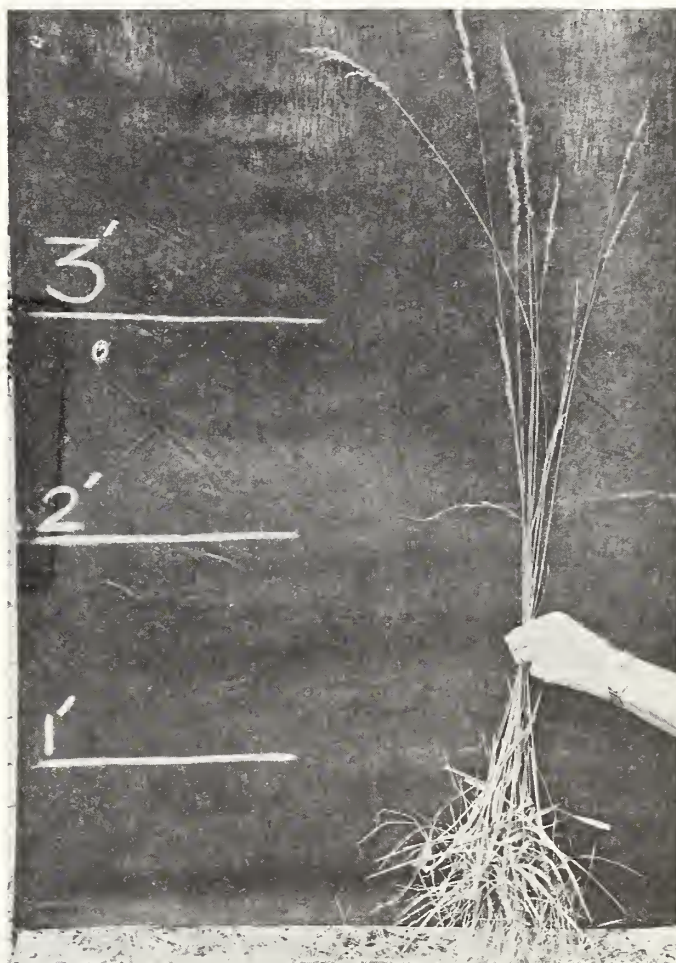
Purple silkyscale tends to have longer and more slender, erect blades. Green silkyscale blades tend to be shorter and more lax. Both species grow in loose, spreading clumps. Initial growth is slow in the spring but during summer months major development is attained. Major reproduction is from rhizomes. Seed culms are produced in late September and October. During November and early December the grass becomes dormant. Pure stands are rare.

Forage Value and Management

Studies in southern Mississippi indicate that green silkyscale maintained itself under both annual winter burning and proper grazing during the growing season.

In north and west Florida, observations indicate that both species of silkyscale are decreasers on all sites where they occur.

The silkyscale grasses are fair to good forage value during summer, fall and early winter. The amount of forage produced is generally small compared to the total for a plant community in a good condition class on the flatwoods site. Deferments applied to pastures from April or May until seed maturity in October will normally favor the silkyscales and associated grasses.



Silkyscale

F. 755-12

BOTTLEBRUSH THREEAWN

Identification

Bottlebrush threeawn (*Aristida speciformis*) is a perennial with stiff erect culms 20 - 30 inches tall. Sheath and culms round. Blades stiff, 8 - 12 inches long 1/16 - 1/8 inch wide, usually involute, light green above, dark beneath. Ligule minute, a membrane. Mature inflorescence an erect, pale panicle, 6 - 8 inches long, resembling a brush. Awns equal, 1 inch long. Growth from a small, tight clump 1 - 3 inches in diameter.

Distribution and Site Adaptation

Bottlebrush threeawn occurs throughout Florida on a number of sites and a wide variety of soils. Bottlebrush is confined to disturbed areas on good and excellent ranges. When it is found in any abundance on these sites, it is usually associated with these species which are classed as increasers and invaders:

<u>Site</u>	<u>Associated Grass Species</u>
Acid and Sweet	carpetgrass
Flatwoods	low panicums
	annual grasses
	pineland threeawn
	pineland dropseed
	broomsedge bluestem



Bottlebrush threeawn

F-455-2



F-556-1

Rangeland on which bottlebrush threeawn has invaded and replaced the more desirable grasses.

<u>Site</u>	<u>Associated Grass Species</u>
Slough	pineland threeawn annual grasses
Sandhills	pineland threeawn natalgrass low panicum

Growth Habits

Major growth is made during the warm season, although green growth may be observed throughout the year. The showy seed heads usually form in late August and September. Bottlebrush threeawn is very noticeable on poor condition ranges the second growing season after fire. A large number of fruiting culms per plant is characteristic.

Forage Value and Management

Bottlebrush threeawn is classified as an invader on all sites where it occurs. Due to its extremely low palatability and its prolific seeding habits bottlebrush quickly establishes itself on ranges that have been overgrazed or where bad burning practices have been used.

The quality and quantity of forage is very poor. Occasional grazing may occur in early spring on young growth when associated with new growth of pineland threeawn. Deferments during the period needed to encourage the growth of decreaser grasses will provide the needed plant competition to reduce the amount of bottlebrush present.

FLORIDA THREEAWN

Identification

Florida threeawn (*Aristida rhizomophora*) is a warm season perennial, forming a heavy sod from well-developed scaly rhizomes. Blades are 1/16 inch wide, up to 18 inches long, light colored beneath and darker green on upper surface. Blades have a very characteristic spiral or twist the entire length. Ligule absent or minute. Sheaths and blades rounded. Seed stalks are 20 - 34 inches tall including the 7 - 14 inches inflorescence. Culm nodes usually only 2 - 4 inches above ground line. Hair or pubescence totally absent.

Distribution and Site Adaptation

Florida threeawn occurs primarily east of the central Florida ridge from the Baker and Duval SCD's southward to Martin and Palm Beach counties. Rarely found south and west of Okeechobee. The following site and species relationships exist:

Site

Sweet Flatwoods

Associated Grass Species

creeping bluestem
Florida paspalum
pineland threeawn
chalky bluestem
hairawn muhly
switchgrass

Site

Acid Flatwoods

Associated Grass Species

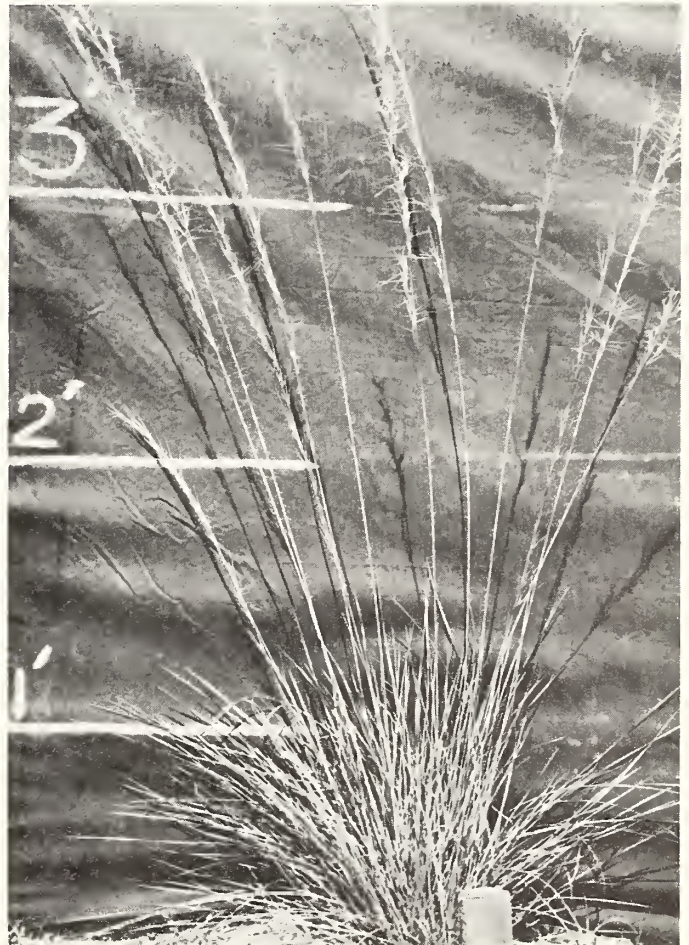
creeping bluestem
chalky bluestem
broomsedge bluestem
blue maidencane
pineland threeawn
toothachegrass

Slough

pineland threeawn
shortspike bluestem
hairy bluestem
blue maidencane

Growth Habits

Normally new growth starts in January or early February. Maximum blade length is attained by the first week in May. Flower stalks are generally produced in May and again in September following a previous winter burn. Non-burned plants usually produce seed stalks during the summer or fall. Major spread is by rhizomes. Forage yield determinations on pure stands average 1,750 pounds of air dry forage per acre by mid-March, following a burn the first week in February. Total herbage of Florida threeawn is approximately 3,000 pounds per acre.



Florida threeawn

F-739-1

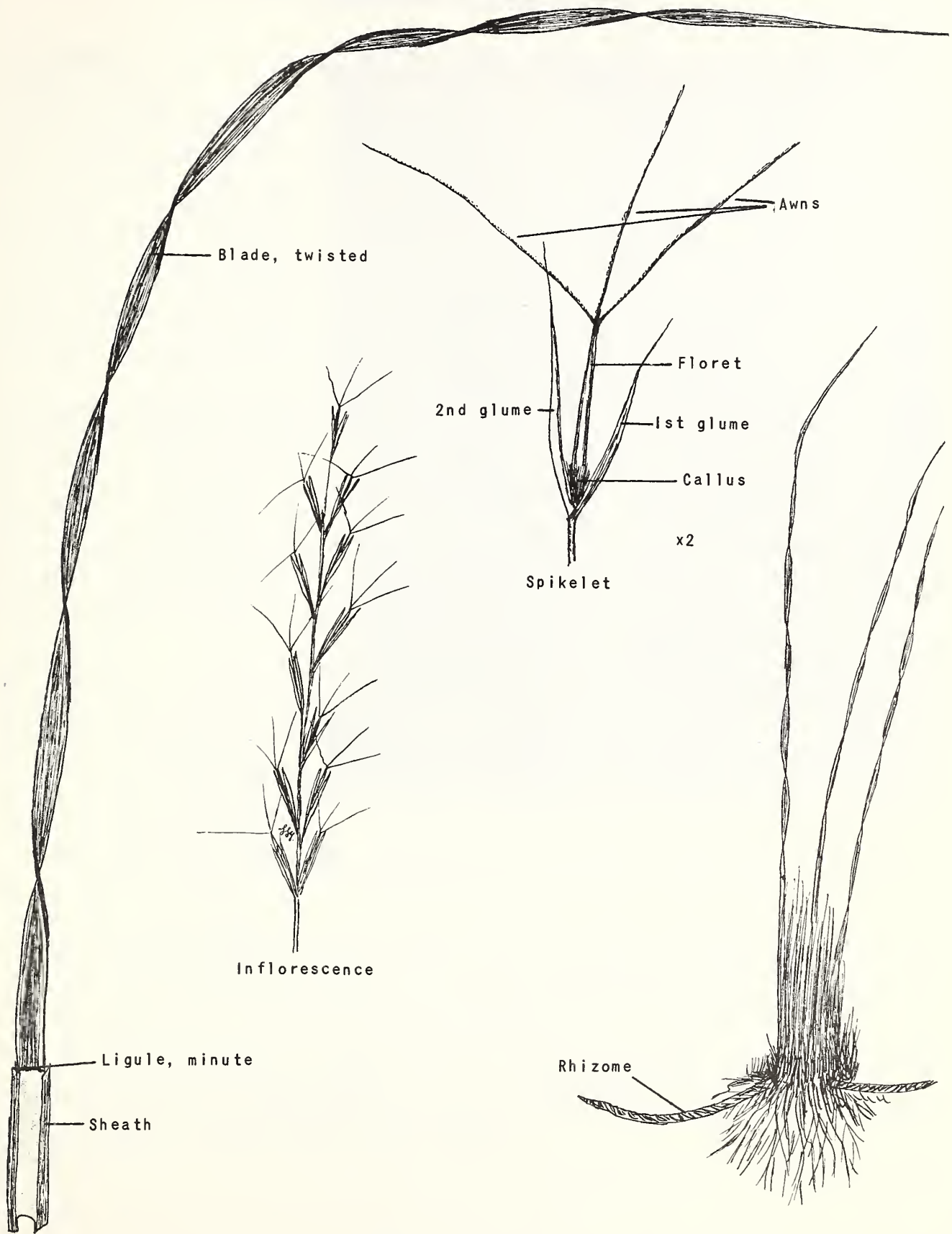
Forage Value and Management

Florida threeawn and associated species have equal palatability from early spring until May or June. Much like pineland threeawn, the palatability decreases sharply during June, and cattle leave these grasses for the bluestems. As a result, Florida threeawn increases to form nearly pure stands.

On poor condition ranges, heavily grazed, Florida threeawn occurs within the protection of saw palmetto and other woody plants. Deferments during the entire growing season followed by proper range use will allow new shoots to develop and produce plants. Where Florida threeawn occurs in pure stands, the following management is possible:

Control burn in January and defer until grass is six inches (mid-March), then graze until late May or early June. Defer again until after first frost in fall and graze during the winter with a protein supplement.

FLORIDA THREEAWN



LONGLEAF THREEAWN

Identification

Longleaf threeawn (*Aristida affinis*) is a warm season, perennial grass producing stiffly erect culms and blades from a knotted crown. Blades are 14 to 16 inches long, flat, very narrow, sharp pointed, nearly involute when dry. Sheaths round, ligule absent or minute. Entire plant glabrous. Inflorescence 12 to 14 inches long, erect, conspicuous in the sand pond site during September.

Distribution and Site Adaptation

Longleaf threeawn occurs throughout Florida. It is specifically adapted to the sand pond site and the margins of the fresh marsh site. Associated grasses on these sites are maidencane, broomsedge bluestem and Florida jointtail composing a stable plant community.

Growth Habits

Major growth is made during the period February to July. Vegetative growth is retarded during the period of water accumulation in the sand ponds and marshes. Longleaf threeawn has the ability to withstand long periods of

standing water which is characteristic of the sites where it occurs. Seed is generally produced during September, however, occasional seed heads may be observed as early as June.

Forage Value and Management

Limited observations indicate longleaf threeawn to be an increaser on the sites where it occurs. Sand ponds in good and excellent condition class have only a small percentage of longleaf threeawn. Only after extremely heavy grazing will longleaf threeawn begin to disappear and be replaced by invaders such as annual grasses and beakrushes.

The value of forage produced by longleaf threeawn is very low. Some grazing is obtained during spring months when new growth is green and tender. As soon as seasonal flooded conditions occur during July, August and September forage values decrease rapidly. Very little fall grazing or winter roughage is available from longleaf threeawn.



Longleaf threeawn

F- 745-3

PINELAND THREEAWN

Identification

Pineland threeawn (*Aristida stricta*) is widely known as "wiregrass". A perennial bunchgrass, seed stalks 18 inches to over 3 feet tall. Leaf blades 12 - 20 inches long and narrow, rolled inward (wire-like), hairy on upper side at the base. Panicle 10 - 12 inches long, slender, awns nearly equal. Sometimes very short thin rhizomes present.

Distribution and Site Adaptation

Pineland threeawn is distributed throughout Florida on a wide variety of soils. Its greatest occurrence is on the flatwoods sites. As a part of the potential plant community, pineland threeawn is associated with the following sites and species:

<u>Site</u>	<u>Associated Grass Species</u>
Acid Flatwoods	creeping bluestem chalky bluestem cutthroat grass (Highlands & Polk SCD's) broomsedge bluestem lopsided Indiangrass toothachegrass Curtiss dropseed



Pineland threeawn

F-455-11

<u>Site</u>	<u>Associated Grass Species</u>
Sweet Flatwoods	Florida threeawn creeping bluestem lopsided Indiangrass switchgrass tall threeawn Florida paspalum
Sloughs	blue maidencane bluejoint panicum
Sandhills	Indiangrass switchgrass Gulf bluestem splitbeard bluestem hairy panicum low panicums

Growth Habits

Pineland threeawn starts new growth in January in south Florida and late February and early March in north Florida. Growth is rapid and leaf blades reach 6 - 8 inches in four weeks if not restricted by a freeze or prolonged cold spell. Seed heads form during May and June. Occasionally short thin rhizomes form on plants which have been recently burned. Mature individual plants, unburned for 2 - 3 years, are 6 - 8 inches at ground level and have coarse wire-like blades.

Forage production is very low. On the Caloosa Experimental Range, Ft. Myers, approximately 640 pounds of air dry forage are produced from February 14 until May 30. Total herbage produced is 1,700 pounds by the end of the first growing season following a burn.

Forage Value and Management

Pineland threeawn is classified as an increaser on the major sites where it occurs. It has increased from its approximately 15 percent by weight in the climax to the 80 or more percent of the total on poor condition class ranges of the flatwoods sites. Due to its long period of unpalatability (late May through January on burned ranges) pineland threeawn completes the required growth cycle needed to maintain plant vigor. On unburned ranges, pineland threeawn completes the needed growth cycle each year. Creeping bluestem, chalky bluestem and other associated decreaser grasses are palatable throughout the growing season. As a result, these grasses are used excessively and pineland threeawn increases and finally dominates overgrazed ranges. Chemical composition of pineland threeawn for two years following burning on February 14, 1957:

	<u>Crude protein %</u>	<u>Calcium %</u>	<u>Phosphorous %</u>
March 7, 1957	12.0	.10	.14
April 18, 1957	7.0	.10	.12
May 16, 1957	5.10	.08	.04
July 11, 1957	3.30	.06	.03
November 8, 1957	2.38	.05	.01
February 12, 1958	2.13	.05	.01
May 12, 1958	2.60	.07	.02
August 12, 1958	2.30	.05	.02
November 12, 1958	2.50	.06	.02
February 10, 1959	2.80	.06	.01

With good range management practices, pineland threeawn is replaced by more desirable native grasses. Heavy seasonal use of pineland threeawn when palatable, followed by a deferment until seed maturity of the bluestems, will encourage the spread of the better grasses. Pineland threeawn is easily controlled by double chopping during early spring months. A complete deferment following chopping operations also encourages the growth and spread of the more desirable grasses.

TALL THREEAWN

Identification

Tall threeawn (*Aristida patula*) is a warm season, perennial bunchgrass forming clumps as much as 12 - 16 inches in diameter at the base. Culm erect, 3 - 5 feet tall. Inflorescence an open, loose panicle, one-third to one-half the entire length of the culm. Blades flat 1/8 - 1/4 inch wide, 12 - 14 inches long, involute when dry. Sheaths round on the back, ligule a minute membrane or absent. Central awn 1 inch long, the lateral two 1/2 inch.

Distribution and Site Adaptation

Tall threeawn is distributed throughout peninsular Florida but primarily in the southwest counties. It is also found northeast of Lake Okeechobee. Only scattered plants occur elsewhere in Florida. As a component part of the total plant community, tall threeawn is adapted primarily to one site and is associated with the following species:

<u>Site</u>	<u>Associated Grass Species</u>
Sweet	creeping bluestem
Flatwoods	South Florida bluestem
	Florida paspalum
	Gulfdune paspalum
	pineland threeawn
	switchgrass

Growth Habits

In the center of its range, tall threeawn remains green throughout much of the year. The grand growth period is from February through late July. The large open and conspicuous seed head is usually formed by late August. Only a small amount of growth is produced during or immediately following the wet summer months.

Forage Value and Management

Tall threeawn is classified as an increaser on the sweet flatwood site of south Florida. As an increaser, it does not play a significant role in the stages of plant succession. It is slow to change its position in the amount present and rarely occurs in pure stands.

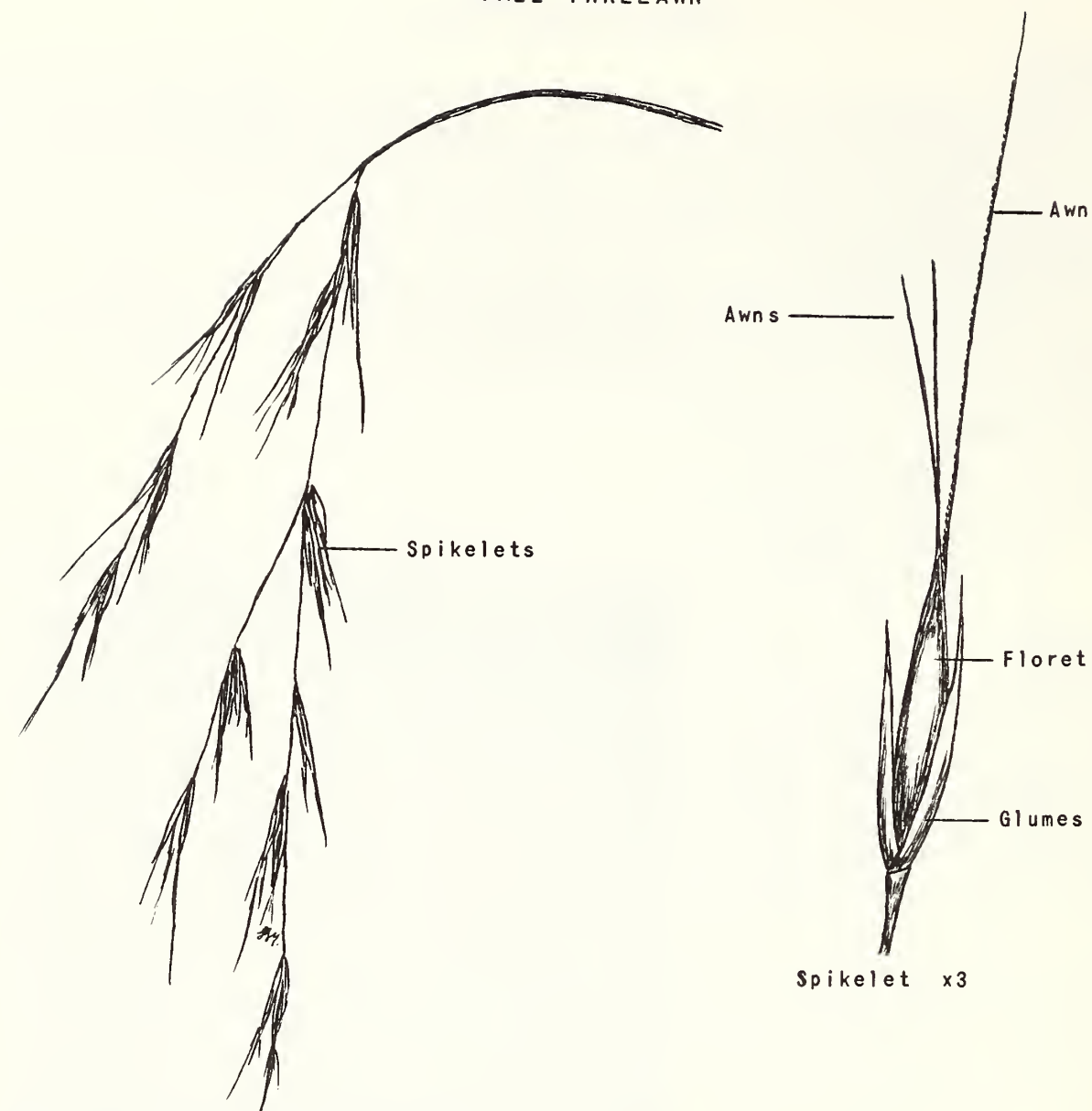
Good forage is produced during spring and early summer months. As soon as seed heads are formed, cattle shift their preference to other forage plants. Tall threeawn is not the major forage producing grass upon which proper range use should be determined on the sweet flatwood site. As an increaser grass, it does not increase to the extent that pure stands are formed which require specific management.



Tall threeawn

F-633-10

TALL THREEAWN



Drooping branch of inflorescence



Cross section of blade
x16

TOOTHACHEGRASS

Identification

Two species occur. Toothachegrass (*Ctenium aromaticum*) is a warm season bunchgrass which forms dense tussocks. Ligule a membrane. A row of glands on each side of the midnerve of the second glume. Lemma and second glume with a stout curved awn. Florida toothachegrass (*Ctenium floridanum*) is a warm season perennial having creeping scaly rhizomes. Ligule a membrane, glands absent on glumes, lemma and second glume with a slender straight awn. Both species have blades 1/4 to 1/2 inch wide nearly white above, light green beneath. Seed stalks are 3 to 4 feet tall with spikelets on one side of the rachis. Inflorescence comblike spike. Base of culms immediately beneath the soil surface produce a deadening effect on the tongue when chewed.

Distribution and Site Adaptation

Both species of toothachegrass occur throughout Florida and generally occur on the same sites. The following are sites on which the toothachegrasses are considered to be a part of the potential plant community, and the more important species associated with them:



Toothachegrass

F-425-10

<u>Site</u>	<u>Associated Grass Species</u>	<u>Site</u>	<u>Associated Grass Species</u>
Slough	Florida threeawn blue maidencane shortspike bluestem gulfdune paspalum pineland threeawn hairy bluestem	Acid Flatwoods	creeping bluestem lopsided Indiangrass chalky bluestem broomsedge bluestem pineland threeawn Curtiss dropseed blue maidencane
<u>Site</u>	<u>Associated Grass Species</u>		
Sweet Flatwoods	creeping bluestem Florida threeawn tall threeawn Florida paspalum blue maidencane chalky bluestem		

Growth Habits

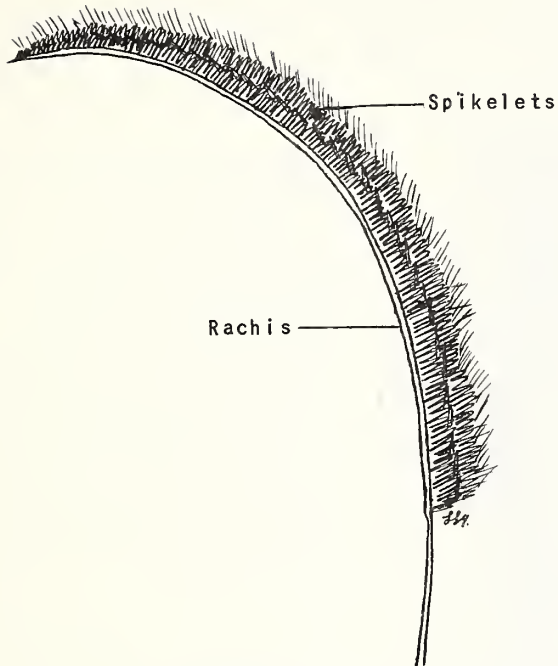
Growth usually commences in mid-January in south Florida. Often 6 - 10 inches of new growth is obtained by mid-March. Major vegetative growth occurs during March, April, and May. Seed ripens in late May or early June. Regrowth occurs again in October and November. Toothachegrass occasionally forms pure stands. A large number of seed stalks are produced by each plant.

Forage Value and Management

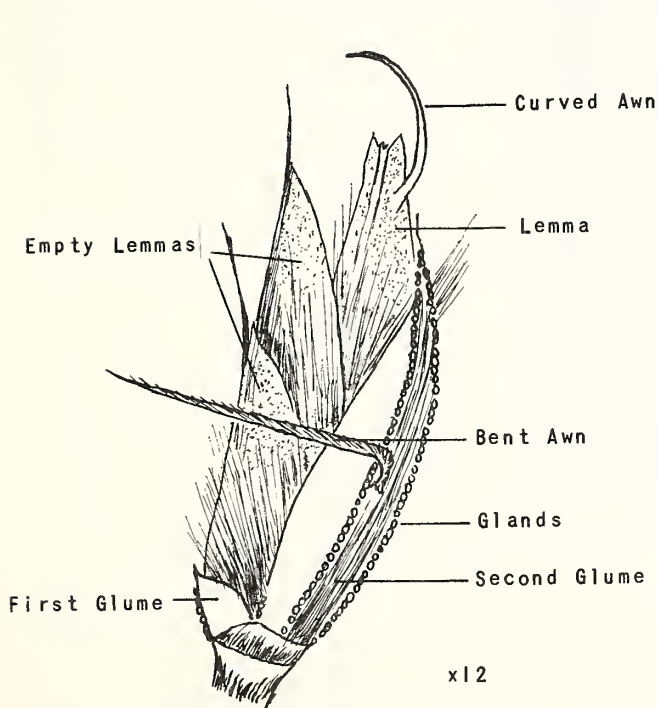
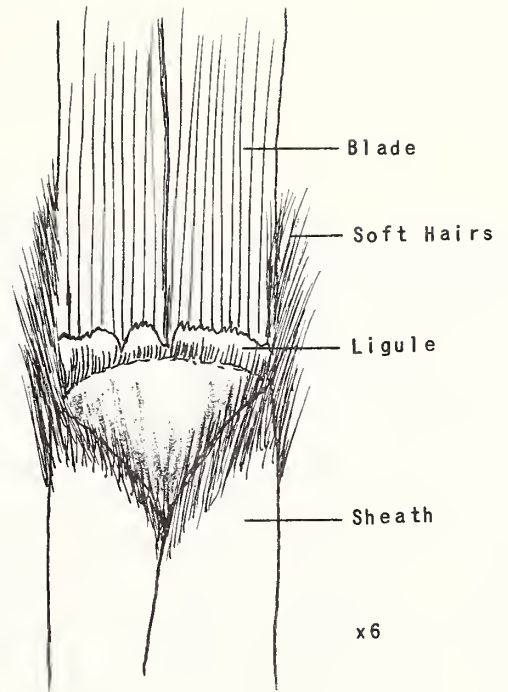
Toothachegrass is classified as a decreaser on the sites where it occurs. As a component part of the total plant community, toothachegrass is not a dominate species.

Cattle utilize the toothachegrasses best during the spring and summer months. Proper use of either range or grazable woodland is rarely determined by the use of toothachegrass.

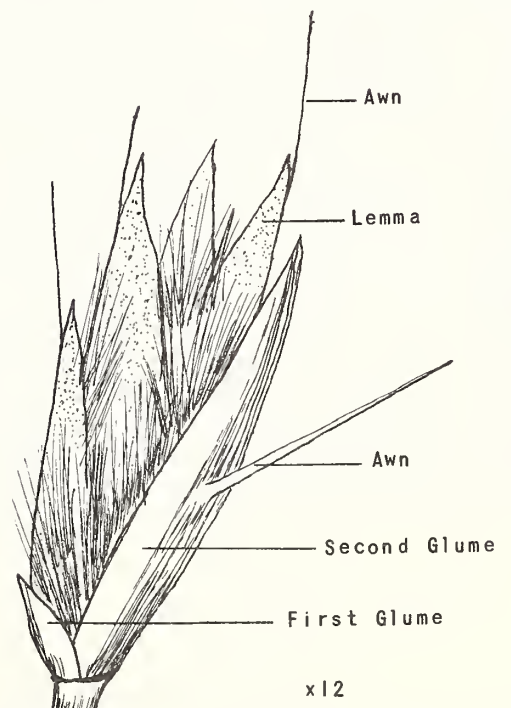
TOOTHACHEGRASSES



Inflorescence a Spike (both species)



Spikelets
Toothachegrass



Spikelets
Florida Toothachegrass

UNIOLAS

Identification

Three species of uniola are represented: longleaf uniola (*Uniola sessiliflora*); spike uniola, (*Uniola laxa*) and seaoats (*Uniola paniculata*). All are tall, erect perennials with flat blades, open panicles with broad or flattened spikelets. Seaoats has extensively creeping rhizomes; the other two species have short rhizomes. Inflorescences are usually very showy and the nodding panicles are characteristic. Seaoats is the more robust of the three with wider blades, taller culms and larger panicles.

Distribution and Site Adaptation

All three species of uniola occur throughout Florida; a representative may be found locally in nearly every SCD in Florida. Seaoats occurs on the coastal sands and beach dunes along the Atlantic and Gulf coasts. Spike and longleaf uniolas are adapted to the hammocks and bottomland sites where they are part of a potential plant community. The latter two species prefer soils with high levels of fertility and organic matter content.

Growth Habits

Seaoats produces culms 3 to 5 feet tall from new shoots arising from strong extensively creeping rhizomes. Large nodding panicles 12 - 20 inches long are produced in late August and September. Dense colonies are frequently observed in the coastal beach areas. Spike and longleaf uniola are very similar in growth habits. Both make major vegetative growth early in the year and generally produce seed by June. These two species may be considered cool season growers. Considerable green material remains through most of the summer months. A few seed may be produced during the early fall. Both species produce new growth and spread primarily from short, knotty, sharp pointed rhizomes. Both longleaf and spike uniola are shade tolerant. They grow well under medium tree canopies on hammock and bottomland sites.



Longleaf uniola

F-755-1

Forage Value and Management

Longleaf and spike uniola are decreasers on the sites where they occur. Generally these sites are small and poorly located to facilitate management. This usually results in overgrazing of these grasses. Many flat sedges, low panicums and annuals replace the uniolas.

Good forage during late winter and spring months is available from spike and longleaf uniola. Forage value decreases during summer and fall. Areas are generally too small or poorly located to provide the needed management to increase these grasses. However, when adjacent native grasslands are managed properly, longleaf and spike uniolas will respond. Seaoats is valuable for ornamental purposes, and dune stabilization. Cattle will graze it, but it is seldom grazed, because of the critical nature of the sites on which it occurs.

MISCELLANEOUS GRASSES



Eastern gamagrass

F. 739-7

Florida jointtail (*Manisuris tuberculosa*) is a warm season perennial bunchgrass. Adapted to the more moist sites such as borders of the fresh marsh and sand pond sites. It also occurs in the slough site. Pan American balsamscale (*Elyonurus tripsacoides*) is very similar in general appearance and usually occurs on the same site. Both are poor to fair forage value.

Eastern gamagrass (*Tripsacum dactyloides*) is a robust perennial grass with thick knotty rhizomes. Distributed throughout Florida. Adapted to the more fertile soils of the hammocks and bottomland sites. A decreaser on all sites where found. Excellent forage. This grass is closely related to corn. The seeds are generally of low quality.



Florida jointtail

F. 457-3



Florida bluestem

F-755-10

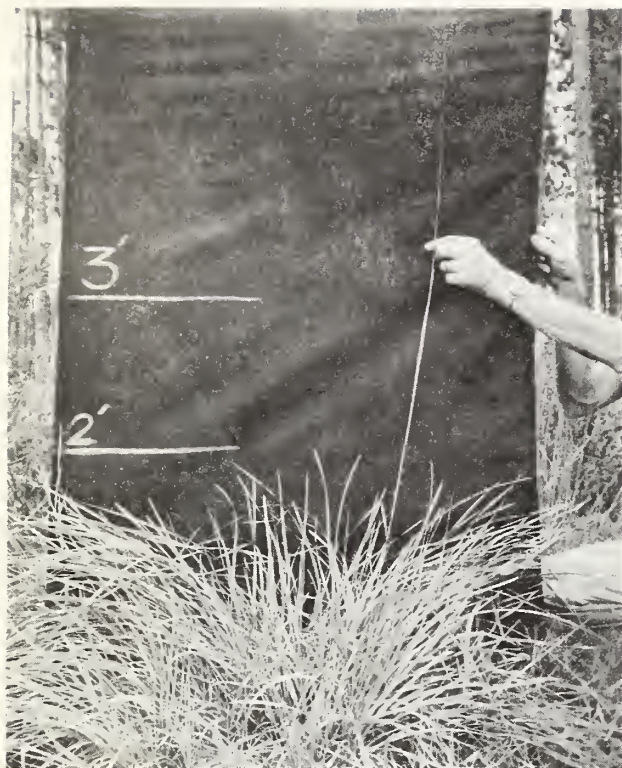
Florida bluestem (*Andropogon floridanus*) is a warm season perennial bunchgrass. Distributed throughout Florida. Adapted to the sand scrub site. Produces seed during October. Poor to fair forage value. Somewhat resembles bushy beardgrass.

Tracy bluestem (*Andropogon tracyi*) is a warm season, perennial bunchgrass. Distributed throughout the northern half of Florida. Adapted to the sandhill site. Grand growth period from March through May. Seed are produced in late May. Fair forage value. Resembles splitbeard bluestem.



Tracy bluestem

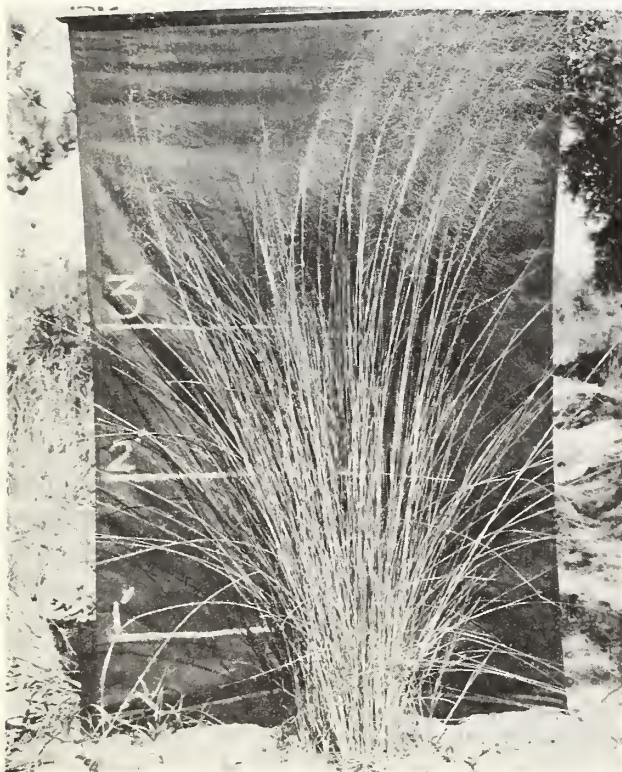
F-726-10



Florida dropseed

F-761-2

Florida dropseed (*Sporobolus floridanus*) is a large perennial bunchgrass with wide, flat, slightly twisted blades. Inflorescence an open panicle 12 to 20 inches long. Seed stalks produced in October, one or two to a single plant. Adapted to the acid flatwood site from the Pasco SCD northward into north and west Florida. Florida dropseed is usually a small part of the potential plant community in the grazeable woodlands. Pure stands occur but are small in extent. Fair forage during spring and summer months.



Gulf muhly

F-761-6

Gulf muhly (*Muhlenbergia capillaris* var. *filipes*) is a perennial bunchgrass with culms 3 to 5 feet tall. Blades narrow, semi-involute 12 to 20 inches long. Auricle 1/4 inch long. Inflorescence 12 to 18 inches long, open, delicate and distinctive purple when mature during September and October. Distributed throughout Florida on soils with a marl or limerock subsoil. A similar species, hairawn muhly, (*M. capillaris*) has flat blades and smaller seed head. Both species are of minor importance as forage.



Plumegrass

F-755-5

Plumegrass (*Erianthus spp.*) is a very conspicuous, robust perennial bunchgrass, distributed throughout Florida. The dense silky seedheads develop during September and October. Two or three species of plumegrass make up a small percentage of the total of any plant community. Very palatable with forage of good quality. Particularly adapted to the more moist sites and soils with a high fertility.

SUMMARY OF GRAZING MANAGEMENT PRINCIPLES

Management of native forage resources for their maximum use and production is dependent upon a knowledge and application of basic grassland management principles. These basic concepts apply generally to all the rangeland and grazable woodlands that occur in Florida. Each ranch has its own combination of soil, water, forage, and animal resources which must be managed according to their basic potentials and needs for improvements.

Sites

Landowners, managers, and technicians need to recognize the capability of the different kinds of range or grazable woodlands available for management. Simply defined, a site is a distinctive kind of rangeland or grazable woodland that has a certain potential for producing native plants. The inherent productive capacity of land depends upon the combined effect of the soil and climate. The particular combination of environmental factors upon a site produces a plant community of different kinds of native vegetation. Different sites are recognized because of: (1) differences in the kind or amounts of plants that make up the potential plant communities or (2) differences in the total yield of the potential plant community.

Plant Responses to Grazing

Cows are very selective grazers when a choice is available. They prefer certain plants to others during certain seasons. In addition, various parts of plants are preferred to others. For example, they generally prefer the leaves of grasses to the seed stalks, yet when grasses ripen their seeds, cattle have been noticed to select the seed heads rather than the leaves and stems.

Cows like a variety of foods - grasses, forbs and shrubs. Their preference varies throughout the season. Ranges and grazable woodlands of Florida have a large variety of native plants, especially grasses, from which cattle will continue to select a diet.

Grasses most preferred by cows during the growing season are the ones that are grazed the closest. If these plants are continually grazed closely year after year, they decrease in amount or die out. These are called decreasers. Some grasses which decrease in Florida are creeping bluestem and Indiangrass on the flatwood site; maidencane on the fresh marsh site; and blue maidencane on the slough site.

Plants that are less palatable replace the decreasers under close grazing. They increase in number in a pasture. Plants in this group, then, are called "increasers". These plants are usually less productive. Examples of grasses in this group are broomsedge, bluestem and pineland threeawn on the acid flatwood site; species of paspalum and beaked panicum on the fresh marsh.

Continuous heavy grazing even on the increasers has its effect. Eventually these are weakened and are replaced by invaders. These plants are foreign to the plant community and for the most part are low producers of forage or totally undesirable. Example of these are: Bottlebrush threeawn and common carpetgrass on the acid flatwood site, and big carpetgrass and sand cordgrass on the fresh marsh site.

Plant Succession

Native grasses are those that grew in Florida long before the period of exploration and finally the settlement by early colonists. The natural balance of plants, soil and climate undisturbed

by man and his grazing animals was the result of slow development over thousands of years. This slow change and build-up in the native forage complex over long periods of time is called plant succession. Open stands of pine, cabbage palm or liveoak with an understory of grass, forbs and woody plants became the end result depending on the kind of land or site. Large open marshy areas developed because low elevations resulted in excess water.

In most of our rangelands and grazable woodlands, the slow process of succession has been completed at least once and a lasting type of plant community was reached many years ago. For all practical purposes we can say that of all native plants, the grasses are capable of supporting the greatest number of livestock. Cattle were introduced into Florida over 400 years ago. This is where man and the grazing animals entered into the picture. The grasses cattle liked best were frequently grazed close to the ground. Cattle were eventually fenced into pastures where they repeatedly grazed the same grasses. Grasses weakened and died. Their place was taken by plants that were less preferred by cattle. The total number of undesirable plants increased and occupied much of the area. Some of these are gallberry, waxmyrtle and saw palmetto. This resulted in a less productive range. The change occurred gradually over a long period of time.

The downward trend of condition of native grazing lands can, through good management practices, be reversed. The natural balance which existed hundreds of years ago often is difficult to obtain. The upward trend or secondary succession where the better native grasses are again re-established, is one of the goals of native forage management. Therefore, proper use and seasonal use of these grasses must receive careful consideration in developing a 12-month forage program. Some of the more important range management practices are:

Proper Grazing Use: This means controlling the grazing to regulate removal of the foliage of grasses so root growth, forage production and general health of the plants are not adversely affected. No more than 50 percent of the current year's growth, by weight, should be harvested from the key forage plants. There is a direct relationship between the above-ground parts of the plant and the roots. The roots supply water and soil nutrients that are used by the leaves to manufacture plant food. In addition, the roots are used for storage of food supplies. These food reserves are used when grasses start growth in the spring or regrowth after they have been closely grazed during the summer growing season. By applying proper grazing use, the better desirable grasses will regain vigor, spread and become more productive. A good rule to follow is "take half and leave half".

Deferred Grazing: This conservation practice is used to periodically vacate a pasture or postpone grazing for a prescribed period during any growing season of the year. The primary purpose of deferred grazing is to allow the decreaser and more desirable increaser grasses to gain vigor and reproduce. Maximum results are obtained when the period of deferment extends from the time that the better grasses commence growth until seed are mature. Repeated deferments are frequently needed to accomplish a change in condition class. Full growing season deferments are needed immediately following mechanical or chemical control of brush or weed species.

Brush Control: Many species of undesirable plants, particularly saw palmetto, gallberry, waxmyrtle, pickerelweed and duck potato occur in Florida. These species occupy many acres of native grazing land and are utilizing water and plant nutrients which could well be used by grass. These unwanted brush species can be controlled by mechanical and chemical methods as well as fire. However, brush control is more effective and more profitable if it is done in combination with good grazing management. Forage production is greater, and the length of time between treatment is extended.

Native Forages in a Coordinated Program

Cost-return analysis of commercial beef cattle ranches in Florida indicates that net returns per acre are greatest on operating units which use a combination of improved pasture and range or grazable woodlands. With good herd management, fertilized pastures are used for the production of weaning calves, while grazable woodlands or ranges are used for wintering the dry cow herd. Such a program eliminates the need for reserving costly tame pasture for winter grazing or for the production of hay for winter feed.

The greatest expense chargeable to native forages used during winter months from grazable woodlands or ranges is taxes, water developments (where needed) and fencing. However, cows must be fed a protein supplement when grazing native forage in winter. But a protein supplement is cheap compared to annual winter pastures or baled hay.

Research and practical rancher experience both bear out the feasibility of coordinating the use of fertilized pastures, native forage and good animal husbandry practices. The balance between improved pastures and native forage that yields the greatest net return on commercial beef cattle operations is to have enough improved pasture to carry the cow-calf herd from the time calves are about two to two and a half months old until they are weaned in the fall. The length of time cows are on improved pasture depends on the age calves are weaned, but usually the herd is on pasture six to eight months. After the calves are weaned, the dry cow herd can be maintained and carried through the winter cheaper on native forage. The breeding season should be regulated to get the most out of this type of program. Cows should be bred to calve 60 to 90 days prior to the normal spring green-up of improved pastures.

MAJOR SITES OCCURRING IN FLORIDA

This site is nearly level, poorly drained, strongly acid to neutral, sandy soils in broad flats or sloughs that are covered with shallow, slow moving water during the wet summer season. Representative soils are Pompano, Charlotte and Felda sands. Major species are blue-joint panicum, blue maidencane, hairy blue-stem, toothachegrass.



Slough site - Good condition

F-484-11



Acid flatwoods - Fair condition

F-824-6

This site is nearly level, somewhat poorly drained, deep sandy soils with organic stained pan at about 2 feet deep. Representative soils are Leon and Immokalee sands. Major grass species are creeping bluestem, lopsided Indiangrass, blue maidencane, pineland threeawn and chalky bluestem.



Sweet flatwoods site - Good condition

F-836-7

This site is nearly level, slightly acid to neutral, somewhat poorly drained deep sandy soils, frequently underlain with marl or limestone rock. Representative soils are Adamsville, Keri and Sunniland. Major grass species are creeping bluestem, switchgrass, South Florida bluestem, chalky bluestem, and Florida paspalum.



Sandhill site - Excellent condition

F-809-10

This site is nearly level to strongly sloping, strongly acid, well drained to excessively drained, deep sandy upland soils with more than 30 inches of sandy material. Representative soils are Lakeland, Blanton (high) and Eustis sands. Major grass species are creeping bluestem, lopsided Indiangrass, needlegrass, splitbeard bluestem and lovegrasses.



Salt Marsh (mineral) - Excellent condition

F-322-10

This salt marsh site is generally at sea level but varies by a plus or minus one foot. The land is level and is cut by tidal creeks and estuaries. The soils are poorly drained with profiles saturated by regular tidal action. Soils are primarily sandy clay loams, usually underlain with limestone at varying depths of 18 to 36 inches or more. Major grass species include seashore saltgrass, marshhay cordgrass and smooth cordgrass.

CONDITION CLASS

Condition of rangeland or the understory herbage of grazable woodlands may be thought of as a state of "health". We speak of our own health as good or poor in relation to the best health we can have. Thus, condition classes are relative. If a particular site is described as being in "poor condition" or in "good condition", the description is always relative to the kind and amount of native vegetation that the site is capable of producing. Condition classes on rangeland and grazable woodlands are expressed in four degrees. These represent the extent to which the composition of the present plant community has departed from the potential for the site. The four condition classes are defined as follows:

<u>Condition Class</u>	<u>Percent by weight of present vegetation that is potential for the site</u>
Excellent	76 - 100
Good	51 - 75
Fair	26 - 50
Poor	0 - 25

FOUR CONDITION CLASSES ON FRESH MARSH SITES

Difference in use alone caused the differences on this native pasture. Soil and climate are the same. Proper use and deferments can make all look like the top picture.

Maidencane and cutgrass produce 76 - 100 percent of all the herbage on this fresh marsh site. Approximately 8,000 - 9,000 pounds of air dry forage is produced per acre.



Excellent Condition

F-674-1

Between 51 - 75 percent of the total herbage is produced by maidencane and cutgrass. The remainder is from less desirable plants such as broomsedge and low paspalums. Approximately 4,000 - 8,000 pounds of air dry forage per acre is available.



Good Condition

F-711-7



Fair Condition

F-711-6

Very little of the desirable maidencane remains. Between 26 - 50 percent of the total herbage produced is from desirable grasses. Less desirable grasses include big carpetgrass, low paspalums and sand cordgrass. Approximately 2,500 - 4,000 pounds of air dry forage per acre is available.



Poor Condition

F-493-11

Only scattered plants of maidencane remain. Less than 25 percent of the total herbage is produced by desirable grasses. Only 1,500 - 2,500 pounds of air dry forage per acre is available. Less desirable grasses which dominate the site are sand cordgrass, carpetgrass, low paspalums plus a forb, blue iris.

GLOSSARY

Acuminate -	Gradually tapering to a sharp point.
Acute -	Sharp-pointed, but less tapering than acuminate.
Annual -	Within 1 year. Grasses which do not live more than one year. New plants are produced from seed each year.
Appressed -	Lying against or pressed to another part of the plant. Blades may be appressed to a culm.
Auricle -	An ear. Ear-like lobes at the base of the blade or summit of the sheath.
Awn -	A slender bristle at the end or on the back side of a glume or lemma. Found in the spikelet of grasses.
Axil -	The angle between parts of a grass, such as between leaf and culm.
Axillary -	Growing in the axil.
Blade -	The part of a leaf above the sheath.
Bristle -	A stiff awn usually found at the base of a spikelet.
Canopy class -	Percentage of the ground shaded by the overstory canopy at midday. Open, 0 to 25%; sparse, 26 to 50%; medium, 51 to 75%; dense, 76 to 100%.
Caryopsis -	The grain or fruit of grasses.
Ciliate -	Fringed with hairs on the margin.
Collar -	The area on the outside of a leaf at the junction of sheath and blade.
Compressed -	Flattened laterally as the basal sheaths and culms as in some of the bluestems.
Condition class -	The present state of the vegetation compared with that which would be stable or climax for the site. Expressed in percentages by weight of present vegetation compared to the potential. Excellent, 76 to 100%; good, 51 to 75%; fair, 26 to 50%; poor, 0 to 25%.
Culm -	The jointed stem of grasses.
Decreaser -	Grasses and other forage plants that decrease as a result of heavy use. Usually the best and most palatable grasses.
Decumbent -	Said of stems or culms which lie down or are horizontal.
Dense -	Refers to the crowded condition of spikelets in an inflorescence.
Drooping -	Inclining downward from above, as a nodding panicle.
Elongate -	Narrow, the length many times the width.

Fertile -	Capable of producing fruit.
Floret -	The lemma and palea with included flower (stamens and pistil) the flower of a grass.
Geniculate -	Bent abruptly.
Glabrous -	Without hairs of any sort.
Glaucous -	Covered with a waxy coating that gives a whitish or bluish cast to leaves or stems.
Glumes -	Bracts at the base of a spikelet.
Hirsute -	With straight stiff hairs.
Increaser -	A plant of the stable plant community that increases for awhile under heavy grazing but finally goes out under continual heavy use.
Inflorescence -	The flower part of a grass.
Internode -	The part of the stem between two nodes.
Invader -	Plants that are either unpalatable or low forage producers that invade and replace the decreaser and increaser plants as a result of continuous heavy use.
Involute -	Rolled inward; curled.
Keeled -	A sharp fold at the back of a compressed sheath.
Leaf -	Composed of a sheath and a blade.
Lemma -	The bract of a spikelet above the glumes.
Ligule -	A membrane or hairy growth on the inside of the collar of a grass leaf.
Node -	The joint of a culm.
Palea -	The inner bract of a floret.
Panicle -	A type of inflorescence. Panicles may be open or spikelike.
Pedicel -	The stalk of a spikelet.
Peduncle -	The stalk or stem of an inflorescence.
Perennial -	Lasting more than one year. In grasses the underground parts last more than one year.
Pubescent -	Covered with hairs usually short and soft.
Raceme -	An inflorescence in which the spikelets are pediceled on a rachis as in the paspalums.
Rachis -	The axis of a spike or raceme.
Rhizome -	An underground stem; rootstalk. Usually slender and creeping with scales at the nodes.

Scabrous -	Rough to the touch.
Sessile -	Without a pedicel or stalk.
Sheath -	The lower part of a leaf that encloses the stem.
Site -	A distinctive kind of rangeland or grazable woodland that has a certain potential for the production of forage plants or a combination of timber and forage. A grouping of similar soils having similar productive potential.
Spathe -	A sheathing bract of the inflorescence, found especially in the bluestems.
Spike -	An unbranched inflorescence.
Spikelet -	A unit of the grass inflorescence consisting of two glumes and one or more florets.
Sterile -	Without pistils.
Stolon -	A propagating stem above ground creeping and rooting at the nodes.
Villous -	Pubescent with long soft hairs.

CHECK LIST OF ALL FLORIDA GRASSES

GENUS AND SPECIES	COMMON NAMES	CHARACTERISTICS*		
<i>Agrostis</i>	Bentgrass			
<i>hiemalis</i>	winter b.	P		
<i>perennans</i>	autumn b.	P		
<i>scabra</i>	rough b.	P		
<i>Aira</i>	Hairgrass			
<i>caryophylllea</i>	silver h.	A	I	
<i>elegans</i>	annual h.	A		
<i>Alopecurus</i>	Foxtail			
<i>carolinianus</i>	Carolina f.	A		
<i>Amphicarpum</i>	Goobergrass			
<i>muhlenbergianum</i>	blue maidencane	P	R	
<i>Andropogon</i>	Bluestem			
<i>arctatus</i>		P		
<i>brachystachys</i>	shortspike b.	P		
<i>cabanisii</i>	cabanis b.	P		
<i>campyloracheus</i>		P		
<i>capillipes</i>	chalky b.	P		
<i>elliottii</i>	Elliott b.	P		
<i>floridanus</i>	Florida b.	P		
<i>gerardi</i>	big b.	P	R	
<i>glomeratus</i>	bushy b.	P		
<i>gracilis</i>	wiry b.	P		
<i>hirtiflorus</i>		P		
<i>longiberbis</i>	hairy b.	P		
<i>maritimus</i>	gulf b.	P	R	
<i>niveus</i>		P		
<i>nodosus</i>	Angleton b.	P	S	I
<i>perangustatus</i>	slim b.	P		
<i>rhizomatus</i>	south Florida b.	P	R	
<i>scoparius</i>	little b.	P		
<i>semiberbis</i>		P		
<i>sericatus</i>		P		Rare
<i>stolonifer</i>	creeping b.	P	R	
<i>subtenuis</i>	fineleaf b.	P		
<i>terner</i>	slender b.	P		
<i>ternarius</i>	splitbeard b.	P		
<i>tracyi</i>	Tracy b.	P		
<i>virginicus</i>	broomsedge b.	P		
<i>var. glaucopsis</i>	purple b.	P		

- * P - perennial
 A - annual
 R - rhizomatous
 S - stoloniferous
 I - introduced

GENUS AND SPECIES	COMMON NAMES	CHARACTERISTICS			
<i>Anthaenantia</i>	Silkyscale				
<i>rufa</i>	purple s.	P		R	
<i>villosa</i>	green s.	P		R	
<i>Anthephora</i>					
<i>hermaphorodita</i>			A		
<i>Anthoxanthum</i>	Vernalgrass				
<i>aristatum</i>	annual v.		A		
<i>Aristida</i>	Threeawn				
<i>affinis</i>	longleaf t.	P			
<i>condensata</i>	big t.	P			
<i>curtissii</i>	Curtiss t.	A			
<i>dichotoma</i>	churchmouse t.	A			
<i>floridana</i>	Key West t.	P			
<i>gyrans</i>	Corkscrew t.	P			
<i>intermedia</i>	Kearney t.	A			
<i>lanosa</i>	woolysheath t.	P			
<i>longespica</i>	slimspike t.	A			
<i>mohrii</i>	Mohrs t.	P			
<i>obligantha</i>	prairie t.	A			
<i>patula</i>	tall t.	P			
<i>purpurascens</i>	arrowfeather	P			
<i>rhizomophora</i>	Florida t.	P		R	
<i>simpliciflora</i>	Chapman t.	P			
<i>spiciformis</i>	bottlebrush t.	P			
<i>stricta</i>	pineland t.	P			
<i>tenuispica</i>	Hillsboro t.	P			
<i>virgata</i>	trinius	P			
<i>Arthraxon</i>	Arthraxon				
<i>hispidus</i>					
<i>var. cryptatherus</i>	fringed a.	A		I	
<i>Arundinaria</i>	Cane				
<i>gigantea</i>	giant c.	P		R	
<i>tecta</i>	switch c.	P		R	
<i>Arundo</i>	Giantreed				
<i>donax</i>	giantreed	P		R	I
<i>Axonopus</i>	Carpetgrass				
<i>affinis</i>	common c.	P		S	
<i>compressus</i>	tropical c.	P		S	
<i>furcatus</i>	big c.	P		S	
<i>Bambusa</i> spp.	Bamboo	P		R	I
<i>Bouteloua</i>	Gramma				
<i>hirsuta</i>	hairy g.	P		S	

GENUS AND SPECIES	COMMON NAMES	CHARACTERISTICS				
<i>Brachiaria</i>	Signalgrass					
<i>plantaginea</i>	creeping s.	A	I			
<i>platyphylla</i>	broadleaf s.	A				
<i>subquadrifera</i>		P	I			
<i>Briza</i>	Quaking grass					
<i>minor</i>	little q.	A	I			
<i>Bromus</i>	Brome					
<i>catharticus</i>	rescuegrass	A	I			
<i>purgans</i>	Canada b.	P				
<i>Cenchrus</i>	Sandbur					
<i>brownii</i>	slimbristle s.	A				
<i>echinatus</i>	southern s.	A				
<i>gracillimus</i>	slender s.	P				
<i>incertus</i>	coast s.	P				
<i>myosuroides</i>	big s.	P				
<i>pauciflorus</i>	mat s.	A				
<i>tribuloides</i>	dune s.	A				
<i>Chloris</i>	Chloris: Windmillgrass					
<i>floridana</i>	twospike w.	P				
<i>gayana</i>	Rhodes grass	P	S	I		
<i>glauc</i>	saltmarsh c.	P				
<i>petraea</i>	stiffleaf c.	P	S			
<i>neglecta</i>	fourspike c.	P				
<i>polydactyla</i>	manyspiked c.	P				
<i>virgata</i>	showy c.	P				
<i>Chrysopogon</i>	Rhaphis					
<i>pauciflorus</i>	Florida r.	A				
<i>Coridochloa</i>	Bugseedgrass					
<i>cimicina</i>	bugseedgrass	A	I			
<i>Cortaderia</i>	Pampasgrass					
<i>selloana</i>	Selloa p.	P	I			
<i>Coix</i>	Jobstears					
<i>lacryma-jobi</i>	jobstears	A	I			
<i>Ctenium</i>	Toothachegrass					
<i>aromaticum</i>	toothachegrass	P				
<i>floridanum</i>	Florida toothachegrass	P	R			
<i>Cymbopogon</i>						
<i>nardus</i>	citronella grass	P				
<i>Cynodon</i>	Dogtoothgrass					
<i>dactylon</i>	Bermudagrass	P	S	R	I	
<i>maritimus</i>	seaside Bermuda	P	S	R		

GENUS AND SPECIES	COMMON NAMES	CHARACTERISTICS			
<i>Dactylis</i> <i>glomerata</i>	Orchardgrass orchardgrass	P	I		
<i>Dactyloctenium</i> <i>aegyptium</i>	Crowfootgrass Durban c.	A	I		
<i>Danthonia</i> <i>sericea</i> <i>spicata</i>	Danthonia downy d. proverty d.	P P			
<i>Digitaria</i> <i>decumbens</i> <i>dolicophylla</i> <i>filiiformis</i> <i>floridana</i> <i>gracillima</i> <i>horizontalis</i> <i>longiflora</i> <i>pauciflora</i> <i>sanguinalis</i> <i>serotina</i> <i>simpsoni</i> <i>subclava</i> <i>villosa</i> <i>violascens</i>	Crabgrass: Fingergrass pangolagrass slender c. Florida c. longleaf f. Jamaica c. India c. twospike f. hairy c. blanket c. Isle-of-pines f. Plant City f. shaggy f. violet c. Bakers c.	P P A A P A P P A A A P P A or P	I I I S I S I		
<i>Distichlis</i> <i>spicata</i>	Saltgrass seashore s.	P	R	S	
<i>Echinochloa</i> <i>coloum</i> <i>crusgalli</i> <i>paludigena</i> <i>walteri</i>	Cockspur jungle-rice barnyard grass Florida c. coast c.	A P A A	I I		
<i>Eleusine</i> <i>indica</i>	Goosegrass	A	I		
<i>Elymus</i> <i>virginicus</i> var. <i>glabriflorus</i>	Wild-rye Virginia w. smooth Southern w.	P P			
<i>Elyonurus</i> <i>tripsacoides</i>	Balsamscale Pan American b.	P	R		

GENUS AND SPECIES	COMMON NAMES	CHARACTERISTICS		
<i>Eragrostis</i>	Lovegrass			
<i>acuta</i>	Florida l.	P		
<i>amabilis</i>	feather l.	A	I	
<i>bahiensis</i>	bahia l.	P	I	
<i>chariis</i>	thalia l.	P	I	
<i>ciliaris</i>	gophertail l.	A		
<i>curvula</i>	weeping l.	P	I	
<i>elliottii</i>	Elliott l.	P		
<i>frankii</i>	sandbar l.	A		
<i>glomerata</i>	pond l.	A		
<i>hirsuta</i>	bigtop l.	P		
<i>hypnoides</i>	Teal l.	A		
<i>lugens</i>	mourning l.	P		
<i>pectinacea</i>	Carolina l.	A		
<i>pilosa</i>	India l.	A	I	
<i>refracta</i>	coastal l.	P		
<i>reptans</i>	creeping l.	A	R	
<i>simplex</i>	fortyflower l.	A		
<i>spectabilis</i>	purple l.	P	R	
<i>stenophylla</i>	slimflower l.	A	I	
<i>tephrosanthos</i>		A		
<i>tracyi</i>	Sanibel Island l.	P		
<i>trichocolea</i>	hairysheath l.	P		
<i>unioloides</i>	Chinese l.	A	I	
<i>Eremochloa</i>	Centipede grass			
<i>ophiuroides</i>	centripede grass	P	S	I
<i>Erianthus</i>	Plumegrass			
<i>alopecuroides</i>	silver p.	P		
<i>coarctatus</i>				
<i>contortus</i>	bent-awn p.	P		
<i>giganteus</i> also var. <i>laxa</i>	sugarcane p.	P		
<i>strictus</i>	narrow p.	P		
<i>Eriochloa</i>	Cupgrass			
<i>michauxii</i>	longleaf c.	P		
<i>polystachya</i>	caribgrass	P	I	
<i>Festuca</i>	Fescue			
<i>elatiior</i>	meadow f.	P		
<i>obtusa</i>	nodding f.	P		
<i>sciurea</i>	squirrel f.	A		
<i>Glyceria</i>	Mannagrass			
<i>striata</i>	fowl m.	P		
<i>Gymnopogon</i>	Skeletongrass			
<i>ambiguus</i>	bearded s.	P	R	
<i>brevifolius</i>	slim s.	P	R	
<i>chapmanianus</i>	Chapman s.	P		
<i>floridanus</i>	Florida s.	P		

GENUS AND SPECIES	COMMON NAMES	CHARACTERISTICS	
<i>Hackelochloa</i> <i>granularis</i>	Pitscalegrass pitscalegrass	A	I
<i>Heteropogon</i> <i>contortus</i> <i>melanocarpus</i>	Tanglehead tanglehead buzzardgrass	P A	Rare Cape Sable
<i>Hordeum</i> <i>pusillum</i>	Barley little c.	A	
<i>Hydrochloa</i> <i>caroliniensis</i>	Watergrass watergrass	P	
<i>Hyparrhenia</i> <i>hirta</i> <i>rufa</i>	thatchgrass Jaragua	P P	I I
<i>Imperata</i> <i>brasiliensis</i> <i>cylindrica</i>	Satintail Brazil s. cogongrass	P P	R R I
<i>Koeleria</i> <i>phleoides</i>	Koeleria annual	A	I
<i>Lasiacis</i> <i>divaricata</i>	Tibisee Florida t.	P	
<i>Leersia</i> <i>hexandra</i> <i>lenticularis</i> <i>monandra</i> <i>oryzoides</i> <i>virginica</i>	Cutgrass clubhead c. catchfly grass bunch c. rice c. whitegrass	P P P P P	R R R R
<i>Leptochloa</i> <i>dubia</i> <i>domingensis</i> <i>filiformis</i> <i>virgata</i>	Sprangletop green s. Dominican s. red s. tropics s.	P P A P	
<i>Leptoloma</i> <i>cognatum</i>	fall witchgrass	P	
<i>Limnodea</i> <i>arkansana</i>	Ozarkgrass	P	
<i>Lolium</i> <i>temulentum</i> <i>multiflorum</i>	Ryegrass darnel Italian r.	A A	I I

GENUS AND SPECIES	COMMON NAMES	CHARACTERISTICS			
<i>Luziola</i> <i>peruviana</i>	Luziola Peruvian I	P			
<i>Manisuris</i> <i>cylindrica</i> <i>rugosa</i> <i>tessellata</i> <i>tuberculosa</i>	Jointtail Carolina j. wrinkled j. lattice j. Florida j.	P	P	R	
<i>Melica</i> <i>mutica</i>	Melic twoflower m.	P			
<i>Melinis</i> <i>minutiflora</i>	molasses grass	P	I		
<i>Miscanthus</i> <i>sinensis</i>	Silvergrass Chinese s.	P	I		
<i>Muhlenbergia</i> <i>capillaris</i> <i>var. filipes</i> <i>expansa</i> <i>schreberi</i>	Muhly hairawn m. Gulf m. cutover m. Nimblewill	P	P	P	R
<i>Monanthochloe</i> <i>litteralis</i>	shoregrass	P		Rare	
<i>Neyraudia</i> <i>reynaudiana</i>	Burmareed	P	I		
<i>Oplismenus</i> <i>setarius</i>	Basketgrass basketgrass	P	S	I	
<i>Oryza</i> <i>sativa</i>	rice	A			
<i>Panicum</i> <i>abscisum</i> <i>aciculare</i> <i>adspersum</i> <i>agrostoides</i> <i>albomarginatum</i> <i>amarum</i> <i>amarulum</i> <i>anceps</i> <i>angustifolium</i> <i>annulum</i> <i>arenicoloides</i> <i>ashei</i> <i>auburne</i> <i>bartowense</i> <i>boscii</i>	Panicum; Witchgrass cutthroat grass needleleaf p. Dominican p. redtop p. whiteedge p. bitter p. seashore p. beaked p. narrowleaf p. sand p. Ashe p. bartow p.	P	P	A	R

GENUS AND SPECIES

COMMON NAMES

CHARACTERISTICS

Panicum (Cont'd)

Panicum; Witchgrass (Cont'd)

<i>breve</i>		P	
<i>capillare</i>	common witchgrass	A	
<i>chamaelonche</i>		A	
<i>chapmani</i>	coral p.	P	
<i>chrysopsidifolium</i>		P	
<i>ciliatum</i>		P	
<i>combsii</i>	Combs p.	P	
<i>commonsianum</i>		P	
<i>commutatum</i>	variable p.	P	
<i>concinnius</i>		P	
<i>condensum</i>		P	
<i>consanguineum</i>		P	
<i>cryptanthum</i>		P	
<i>curtifolium</i>		P	
<i>dichotomiflorum</i>	fall p.	A	
<i>dichotomum</i>	forked p.	P	
<i>ensifolium</i>		P	
<i>erectifolium</i>	erect p.	P	
<i>equilaterale</i>		P	
<i>fasiculatum</i>	browntop p.	A	
<i>flavovirens</i>	wiry p.	P	
<i>flexile</i>		A	
<i>fusiforme</i>		P	
<i>geminatum</i>	Egyptian p.	P	S
<i>glabrifolium</i>		P	
<i>gymnocarpon</i>	Savannah p.	P	
<i>hians</i>	gaping p.	P	
<i>hemitomon</i>	maidencane	P	R
<i>huachucae</i>	hauchuca	P	
<i>joorii</i>		P	
<i>lancearium</i>		P	
<i>lanuginosum</i>	wooly p.	P	
<i>latifolium</i>		P	
<i>leucothrix</i>		P	
<i>lindheimeri</i>	Lindheimer p.	P	
<i>longifolium</i>		P	
<i>longiligulatum</i>		P	
<i>lucidum</i>		P	
<i>malacon</i>		P	
<i>maximum</i>	Guinea grass	P	R
<i>microcarpon</i>	barbed p.	P	
<i>mutabile</i>		P	
<i>neuranthum</i>		P	
<i>nitidum</i>		P	
<i>nudicaule</i>		P	
<i>oligosanthes</i>		P	
<i>ovale</i>		P	
<i>paludivagum</i>	water p.	P	
<i>patentifolium</i>		P	
<i>patulum</i>		P	
<i>pinetorium</i>		P	

GENUS AND SPECIES

COMMON NAMES

CHARACTERISTICS

Panicum (Cont'd)*Panicum*; Witchgrass (Cont'd)

<i>polycaulon</i>	little p.	P		
<i>portoricense</i>		P		
<i>pseudopubescens</i>		P		
<i>purpurascens</i>	paragrass	P	S	I
<i>ramosum</i>	browntop millet	A	I	
<i>ravenelii</i>		P		
<i>repens</i>	torpedograss	P	R	I
<i>reptans</i>	sprawling p.	A		
<i>rhizomatum</i>	hairy p.	P	R	
<i>roanokense</i>		P		
<i>scabriusculum</i>	tall swamp p.	P		
<i>scoparium</i>	velvet p.	P		
<i>sphaerocarpon</i>	roundseed p.	P		
<i>sphagnicola</i>	cypress p.	P		
<i>spretum</i>		P		
<i>stipitatum</i>	purple p.	P		
<i>strigosum</i>		P		
<i>tenerum</i>	bluejoint p.	P		
<i>tenue</i>		P		
<i>texanum</i>	Texas p.	A		
<i>trifolium</i>		P		
<i>vernale</i>	bog p.	P		
<i>verrucosum</i>	warty p.	A		
<i>villosissimum</i>		P		
<i>virgatum</i>	switchgrass	P	R	
<i>webberianum</i>	webber p.	P		
<i>wrightianum</i>	Wright p.	P		
<i>xalapense</i>	Jalapa	P		

*Paspalum**Paspalum*

<i>bifidum</i>	pitchfork p.	P		
<i>blodgettii</i>	coral p.	P		
<i>boscianum</i>	bull p.	A		
<i>caespitosum</i>	blue p.	P	Rare	
<i>ciliatifolium</i>	fringeleaf	P		
<i>conjugatum</i>	sour p.	P	S	
<i>debile</i>	goldhair p.	P		
<i>difforme</i>	thickspike knotgrass	P	R	
<i>dilatatum</i>	dallisgrass	P	I	
<i>dissectum</i>	mudbank p.	P		
<i>distichum</i>	knotgrass; Ft. Thompson grass	P	S	
<i>floridanum</i>	Florida p.	P	R	
<i>fluitans</i>		A		
<i>giganteum</i>	giant p.	P	R	
<i>laeve</i>	field p.	P		
<i>langei</i>	rustseed p.	P		
<i>laxum</i>	coconut p.	P	Rare	
<i>lentiferum</i>	cypress p.	P	R	
<i>longepedunculatum</i>	barestem p.	P		
<i>longipilum</i>	hairyleaf p.	P		

GENUS AND SPECIES	COMMON NAMES	CHARACTERISTICS			
<i>Paspalum</i> (Cont'd)	<i>Paspalum</i> (Cont'd)				
<i>malacophyllum</i>	ribbed p.	P	I		
<i>monostachyum</i>	Gulfdune p.	P	R		
<i>nicorae</i>	Brunswickgrass	P	R	I	
<i>notatum</i>	bahiagrass	P	S	I	
<i>pleostachyum</i>		P	Rare		
<i>plicatulum</i>	brownseed p.	P			
<i>praecox</i>	early p.	P	R		
<i>propinquum</i>	littleseed p.	P			
<i>pubiflorum</i> var. <i>glabrum</i>	hairyseed p.	P			
<i>pubescens</i>	hurrahgrass	P			
<i>rigidifolium</i>	stiff p.	P			
<i>setaceum</i>	thin p.	P			
<i>supinum</i>	longleaf p.	P			
<i>urvillei</i>	Vasey grass	P	I		
<i>vaginatum</i>	seashore p.	P	S		
<i>Pennisetum</i>	<i>Pennisetum</i>				
<i>ciliare</i>	Buffelgrass	P	I		
<i>glaucum</i>	Pearl millet	A	I		
<i>purpureum</i>	Napier grass	P	I		
<i>setosum</i>	West Indies p.	P			
<i>Phalaris</i>	Canary grass				
<i>caroliniana</i>	Carolina c.	A			
<i>Pharus</i>	Leafstalkgrass				
<i>parvifolius</i>	creeping l.	P	S		
<i>Phragmites</i>	Red				
<i>communis</i>	common r.	P	R	S	
<i>Poa</i>	Bluegrass				
<i>annua</i>	annual b.	A	I		
<i>arachnifera</i>	Texas b.	P	R		
<i>autumnalis</i>	autumn b.	P			
<i>pratensis</i>	Kentucky b.	P	I		
<i>sylvestris</i>	woodland b.	P			
<i>Polypogon</i>					
<i>monspeliensis</i>	rabbitfoot	A	I		
<i>Reimarochloa</i>	Reimargrass				
<i>oligostachya</i>	Florida r.	P	S		
<i>Rhynchelytrum</i>					
<i>roseum</i>	Natal grass	P	I		
<i>Rottboellia exaltata</i>	Itchgrass	A	I		
<i>Saccharum</i>	Sweetcane				
<i>officinarum</i>	sugarcane	P	I		

GENUS AND SPECIES	COMMON NAMES	CHARACTERISTICS			
<i>Sacciolepis</i>	Cupsacle				
<i>striata</i>	American c.	P			
<i>indica</i>	India c.	A	I		
<i>Scleropoa</i>	Stiffgrass				
<i>rigida</i>	stiffgrass	A	I		
<i>Setaria</i>	Bristlegrass				
<i>corrugata</i>	coast b.	A			
<i>geniculata</i>	knotroot b.	P		R	
<i>italica</i>	foxtail b.	A		I	
<i>lutescens</i>	yellow b.	A		I	
<i>macrosperma</i>	coral b.	P			
<i>magna</i>	giant b.	A			
<i>viridis</i>	green b.	A		I	
<i>palmifolia</i>	palmgrass	P		I	
<i>Sorghastrum</i>	Indian grass				
<i>elliotii</i>	sender i.	P			
<i>nutans</i>	yellow i.	P		R	
<i>secundum</i>	lopsided i.	P			
<i>Sorghum</i>	Sorghum				
<i>halapense</i>	Johnsongrass	P	R		I
<i>vulgare</i>	sorghum	A	I		
<i>var. sudanense</i>	Sudan grass	A	I		
<i>Spartina</i>	Cordgrass				
<i>alterniflora</i>	smooth c.	P		R	
<i>bakeri</i>	sand c.	P			
<i>cynosuroides</i>	big c.	P			
<i>patens</i>	marshhay c.	P		R	
<i>spartinae</i>	gulf c.	P			
<i>Sphenopholis</i>	Wedgescale				
<i>filiformis</i>	longleaf w.	P			
<i>intermedia</i>	slender w.	P			
<i>nitida</i>	shiny w.	P			
<i>obtusata</i>	prairie w.	P			
<i>Sporobolus</i>	Dropseed				
<i>clandestinus</i>	hidden d.	P			
<i>curtissii</i>	Curtiss d.	P			
<i>domingensis</i>	coral d.	P			
<i>floridanus</i>	Florida d.	P			
<i>indicus</i>	West Indies smutgrass	P			
<i>junceus</i>	pinewoods d.	P			
<i>macer</i>	Mississippi d.	P		R	
<i>poiretii</i>	rattail smutgrass	P			
<i>pyramidatus</i>	whorled d.	P			
<i>virginicus</i>	seashore d.	P		R	

GENUS AND SPECIES	COMMON NAMES	CHARACTERISTICS		
<i>Stenotaphrum secundatum</i>	St. Augustine grass	P	S	
<i>Stipa</i>	Needlegrass: Feathergrass			
<i>avenacoides</i>	Florida n.	P		
<i>avenacea</i>	blackseed n.	P		
<i>Trichachne insularis</i>	Cottontop sourgrass	P		
<i>Tridens</i>	Tridens			
<i>ambiguus</i>	pinebarren t.	P		
<i>carolinianus</i>	Carolina t.	P	R	
<i>chapmani</i>		P		
<i>eragrostoides</i>	lovegrass t.	P		
<i>flavus</i>	purpletop	P		
<i>Triplasis</i>	Sandgrass			
<i>americana</i>	perennial s.	P		
<i>purpurea</i>	purple s.	A		
<i>Tripsacum</i>	Gamagrass			
<i>dactyloides</i>	eastern g.	P	R	
<i>floridanum</i>	Florida g.	P	R	
<i>Uniola</i>	Uniola			
<i>latifolia</i>	broadleaf u.	P	R	
<i>laxa</i>	spike u.	P		
<i>nitida</i>	shiny u.	P	R	
<i>ornithorhyncha</i>	birdbill u.	P	R	
<i>paniculata</i>	seaoats	P	R	
<i>sessiflora</i>	longleaf u.	P	R	
<i>Zizania</i>	Wildrice			
<i>aquatica</i>	annual w.	A		
<i>Zizaniopsis</i>				
<i>miliacea</i>	giant cutgrass	P	R	
<i>Zoysia</i>				
<i>matrella</i>	Manilagrass	P	S	I

ALPHABETICAL LIST OF COMMON NAMES

<u>Common Name</u>	<u>Genus Name</u>
Angleton bluestem	Andropogon
Arthraxon	Arthraxon
Bahiagrass	Paspalum
Balsamscale	Elyonurus
Bamboo	Bambusa
Barley	Hordeum
Basketgrass	Oplismenus
Beardgrass	Andropogon
Bentgrass	Agrostis
Bermuda grass	Cynodon
Blanketgrass	Digitaria
Blue maidencane	Amphicarpum
Bluegrass	Poa
Bluejoint panicum	Panicum
Bluepoint	Amphicarpum
Bluestem	Andropogon
Bog panicum	Panicum
Bristlegrass	Setaria
Brome	Bromus
Broomsedge	Andropogon
Browntop millet	Panicum
Brunswickgrass	Paspalum
Bugseedgrass	Coidochloa
Burmareed	Neyraudia
Buzzardgrass	Heteropogon
Canarygrass	Phalaris
Cane	Arundinaria
Caribgrass	Eriochloa
Carpetgrass	Axonopus
Catchfly grass	Leersia
Centiped grass	Eremochloa
Chloris	Chloris
Citronellagrass	Cymbopogon
Cockspur	Echinochloa
Cogongrass	Imperata
Combgrass	Ctenium
Cordgrass	Spartina
Cottontop	Trichachne
Crabgrass	Digitaria
Crowfootgrass	Dactyloctenium
Cupgrass	Eriochloa
Cupscale	Sacciolepis
Cutgrass	Leersia
Cutthroatgrass	Panicum
Dallisgrass	Paspalum
Danthonia	Danthonia
Darnel	Lolium
Dogtoothgrass	Cynodon
Dropseed	Sporobolus
Fescue	Festuca
Feathergrass	Stipa

<u>Common Name</u>	<u>Genus Name</u>
Fingergrass	Digitaria
Ft. Thompson grass	Paspalum
Ft. Walton grass	Paspalum
Foxtail	Alopecurus
Gamagrass	Tripsacum
Giant cutgrass	Zizaniopsis
Giantreed	Arundo
Gingergrass	Ctenium
Goobergrass	Amphicarpum
Goosegrass	Eleusine
Grama	Bouteloua
Guineagrass	Panicum
Hairgrass	Aira
Hurrahgrass	Paspalum
Hauchuca	Panicum
Indiangrass	Sorghastrum
Itchgrass	Rottboellia
Jalapa	Panicum
Jaragua	Hyparrhenia
Jonstears	Coix
Johnsongrass	Sorghum
Jointtail	Manisuris
Jungle-rice	Echinochloa
Knotgrass	Paspalum
Knotroot bristlegrass	Setaria
Koeleria	Koeleria
Leafstalkgrass	Pharus
Lemongrass	Ctenium
Lovegrass	Eragrostis
Luziola	Luziola
Maidencane	Panicum
Manilagrass	Zoysia
Managrass	Glyceria
Melic	Melica
Millet	Setaria
Molassesgrass	Melinis
Muhly	Muhlenbergia
Napiergrass	Pennisetum
Narrowleaf panicum	Panicum
Natalgrass	Rhynchelytrum
Needlegrass	Stipa
Nimblegrass	Muhlenbergia
Orchardgrass	Dactylis
Ozarkgrass	Limnodea
Paille fine	Panicum
Palmgrass	Setaria
Pangolagrass	Digitaria
Panicum	Panicum
Pampasgrass	Cortaderia
Paragrass	Panicum
Paspalum	Paspalum
Pearl millet	Pennisetum
Pennisetum	Pennisetum

<u>Common Name</u>	<u>Genus Name</u>
Pitscalegrass	Hackelochloa
Plumegrass	Erianthus
Purpletop	Tridens
Quakinggrass	Briza
Rabbitfoot	Polopogon
Rattail smutgrass	Sporobolus
Reed	Phragmites
Reimargrass	Reimarochloa
Rescuegrass	Bromus
Rhapis	Chrysopogon
Rhodesgrass	Chloris
Rice	Oryza
Ryegrass	Lolium
Saltgrass	Distichlis
Sandbur	Cenchrus
Sandgrass	Triplasis
Satintail	Imperata
Seaoats	Uniola
Seaside bermuda	Cynodon
Shoestring grass	Aristida
Shoregrass	Monathochloe
Signalgrass	Brachiaria
Silkyscale	Anthaenantia
Silvergrass	Miscanthus
Skeltongrass	Gymnopogon
Smutgrass	Sporobolus
Sorghum	Sorghum
Sourgrass	Trichachne
Sprangletop	Leptochloa
St. Augustine	Stenotaphrum
Stiffgrass	Schleropoa
Sudangrass	Sorghum
Sugarcane	Saccharum
Sweetcane	Saccharum
Switchcane	Arundinaria
Switchgrass	Panicum
Tanglehead	Heteropogon
Thatchgrass	Hyparrhenia
Thickspike knotgrass	Paspalum
Tibisee	Lasiacis
Threeawn	Aristida
Toothachegrass	Ctenium
Torpedograss	Panicum
Tridens	Tridens
Uniola	Uniola
Vaseygrass	Paspalum
Vernalgrass	Anthoxanthum

Common Name

Watergrass
Wedgescale
Whitegrass
Wildrice
Wildrye
Windmillgrass
Witchgrass
Witchgrass, fall

Genus Name

Hydrochloa
Sphenopholis
Leersia
Zizania
Elymus
Chloris
Panicum
Leptoloma

REFERENCES

- Bennett, Hugh W., Hammons, R. O. and Weissinger, W. R., 1952. The Identification of 76 Species of Mississippi Grasses by Vegetative Morphology. Miss. Ag. Exp. Sta. Tech. Bul. 31.
- Davis, John H., 1943. The Natural Features of Southern Florida. Florida Geological Survey. Bul. No. 25, Tallahassee, Fla., 311 pp.
- Hitchcock, A. S., 1951. Manual of the Grasses of the United States. 2nd Ed. U.S.D.A., Misc. pub. 200.
- Kelsey, H. P., and Dayton, W. A., 1942. Standardized plant names. 2nd Ed. 675 pp.
- Langdon, Gordon O., Bomhard, M. L. and Cassady, John T., Field Book of Forage Plants on Longleaf Pine-bluestem Ranges. So. For. Exp. Sta. Occ. paper 127.
- Shiflet, Thomas N., 1963, Major Ecological Factors Controlling Plant Communities in Louisiana Marshes. Jr. of Range Management. Vol. 16, No. 5.
- Silveus, W. A., 1942. Grasses, Paspalum and Panicum of the United States. 526 pp., illus. pub. W. A. Silveus, 832 Cambridge Oval, San Antonio, Texas.
- Southeastern Forest Experiment Station. 1958. Research Note No. 118, Asheville, N. C. Cattle Stocking and Herbage Yield on Burned Flatwood Ranges. Caloosa Exp. Range, Ft. Myers, Florida.
- Weintraub, Frances C., 1953. Grasses Introduced into the United States. U.S.D.A. Agri. Handbook No. 58.
- Williams, Robert E., 1958. Some Important Southern Range Plants. U.S.D.A. - SCS.
- Wolff, Simon E., 1948. A Guide to Plant Names. Rev. 1954. U.S.D.A. - SCS.
- Yarlett, Lewis L., 1963. Some Important and Associated Native Grasses on Central and South Florida Ranges. Jr. of Range Management, Vol. 16, No. 5.
- _____, 1961. Many Native Grasses in Florida. Florida Cattleman. August, 1961.
- _____, 1963. Management of Gulf Coast Salt Marshes. Jr. of Soil and Water Conservation. Vol. 18, No. 4. July-August, 1963.
- _____, 1964. "Cutthroat Grass Can be Grazed." Florida Cattleman, February, 1964.
- _____, 1963. "Maidencane Yields Top Forage." Florida Cattleman, January, 1963.

